

COPY

Property

Waste

Sample

RELEASE EVALUATION FORM

Page 1 of 2

Release Evaluation No.: 000124-T130B-001 EXTENDED: No EXPIRES: N/A Charge No.: NG2200E1

PART I

SENDER/CUSTODIAN ACKNOWLEDGEMENT

Description of Property/Waste/Sample To Be Released/Transferred: Office Trailers T112A and T112C

Current Location: PU & D Yard

Destination: Offsite sale or disposal

New Recipient/Custodian: Dick Link

History/Process Knowledge: See attached "Reconnaissance Level Characterization Report for T112A and T112C (Revision 1)"

Has the specified material ever been in an RBA/CA or contacted DOE controlled radioactive materials? Unkown

- 1) By signing below, I certify information provided in Part I of this release evaluation to be true and accurate.
 2) By signing below, I agree to comply with the specific requirements noted in Part II of this release evaluation.

Sender/Custodian: [Signature] Emp. No: [Redacted] Date: 1/24/00 Ext: 5352

PART II

RADIOLOGICAL ENGINEERING

SPECIFIC REQUIREMENTS AND/OR COMMENTS: The trailers have been surveyed in accordance with the requirements of MARSSIM and RFCA and have been subjected to the KH D & D Advance Planning Process. The detail of these survey requirements and the results are contained in "Reconnaissance Level Characterization Report for T112A and T112C (Revision 1)". No further survey data is required for unrestricted release of these trailers.

Evaluated: [Signature] Emp. No: [Redacted] Date: 1/24/00 Ext: 5109
 Radiological Engineer

APPROVAL FOR TRANSFER/SHIPMENT

Approved: [Signature] Emp. No: [Redacted] Date: 1/24/00 Ext: 389
 Radiological Engineer

PROPERTY/WASTE RELEASE EVALUATION SIGNATURE REQUIREMENTSRelease Evaluation #: 000124-T130B-001 Page 2 of 2**Release Evaluation for Waste:**

A Release Evaluation for Waste requires an evaluation and unrestricted release approval signature. The evaluation signature is by the Radiological Engineer (RE) providing the methods or criteria for unrestricted release (i.e., survey requirements, analytical requirements, no survey required, etc.). The unrestricted release approval signature for a Release Evaluation for Waste shall be a RE authorized to provide unrestricted release approval. In addition, the evaluation and unrestricted release approval signatures shall not be the same RE. The intent of this provision is to provide peer review of the evaluation and method of unrestricted release. It is important the RE take the peer review process seriously and not become a "rubber stamp" for their fellow engineer.

Release Evaluation for Property:

A Release Evaluation for Property requires an evaluation and unrestricted release approval signature. For a Release Evaluation for Property, the evaluation and unrestricted release signature may be the same RE. In the past, only one signature was required for property for which a RE could provide an unrestricted release on the basis of process knowledge/history.

Release Evaluation for Samples:

Samples are any waste or material that is being shipped to an off-site facility for analysis. Samples that may be provided with an unrestricted release using process knowledge/history or standard contamination survey techniques may be authorized for shipment to an off-site facility using the signatory requirements specified for property. Samples which cannot be provided with an unrestricted release using process knowledge/history or standard contamination survey techniques shall be authorized for shipment from the Site using the methodology specified for waste, i.e., second signature being provided by a RE authorized to perform peer review and approval for shipment.

The approval for transfer/shipment section of a Sample Release Evaluation (SRE) shall be revised as noted below for samples which cannot be provide with an unrestricted release.

"The samples specified in Part 1 of this release evaluation are being provided with authorization for transport as non-radioactive materials in accordance with Department of Transportation (49 CFR) regulation. This authorization for shipment does not constitute an unrestricted release."


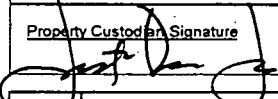
Additional Documentation:

Number of lines per section may be modified or additional pages attached to ensure adequate documentation of information necessary to perform release evaluation.

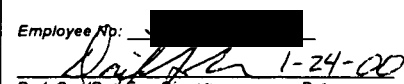
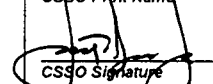
Additional pages or attachments to a release evaluation shall have the evaluation number, Page of , initials of Radiological Engineer signing approval for transfer/shipment and date.

Declaration of Excess

002837

| | | | | |
|-------------------------------------------------------------------------------------------------------------------|--------------------------------|-----------------------------------|------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| Property Custodian Name (Please Print) J. DEVERE | Employee Number [REDACTED] | Custodian Building 3061 | Property's Location NE of B280 | Property Management Approval Signature and Date  12-27-97 |
| Property Custodian Signature  | Extension/Pager 2753 | Custodian Room/Cube 20 | Request Date (10-6) 12-27-97 | To be Filled Out By Disposal Personnel |

| Line Item # | Property Control Number | Serial Number | Description/Manufacturer/Model Number | Qty | Unit of Issue | Cond Code | Qty Rec'd | Storage Location | Date Rec'd | Rec'd By | FSC | Final Disp. |
|-------------|-------------------------|---------------|---------------------------------------|-----|---------------|-----------|-----------|------------------|------------|----------|-----|-------------|
| 01 | 0005621500 | | TRAILER 14' X 56' | 1 | EA | 4 | | | | | | 250 |
| 02 | | | T112C | | | | | | | | | |
| 03 | | | | | | | | | | | | |
| 04 | | | | | | | | | | | | |
| 05 | | | | | | | | | | | | |
| 06 | | | | | | | | | | | | |
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| 10 | | | | | | | | | | | | |

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|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| Unrestricted Property Release Approval The above described item(s) has been evaluated and/or Radiologically surveyed in accordance with RSP 9.01 and is approved for Unrestricted Release. Property Release Log No: _____ PI/WRE No: 000124-T1303-001 Employee No: [REDACTED]  1-24-00 Rad. Ops/Rad Eng Signature Date | | "High Risk" Review Certification <input type="checkbox"/> "No EC/Proliferation" Concern <input type="checkbox"/> "High Risk" Property <input type="checkbox"/> "Export Controlled" Property Export Control Officer Date | ADP Applicable Only These computer systems have met all security requirements as outlined in the appropriate ACSO's and "Computer User Handbook" (Classified and Unclassified) CSSO Print Name NA Employee No _____  12-27-97 CSSO Signature Date | Certification for Removal of Hazardous Material <input type="checkbox"/> YES <input type="checkbox"/> NO If no, by signing below, I certify that all hazardous Material Constituents have been removed from the Property Signature _____ Date _____ | Final Disposition 1 - Transfer 2 - Gift 3 - Grant 4 - Sale 5 - Low Level Waste 6 - Donation 7 - Scrap |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|

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Declaration of Excess

002845

| | | | | |
|----------------------------------------------------------|-------------------------------------|----------------------------------|----------------------------------------|-------------------------------------------------------------------------------|
| Property Custodian Name (Please Print) C. FERG | Employee Number | Custodian Building 061 | Property's Location 280 YARD | Property Management Approval Signature and Date <i>[Signature]</i> 1/24/00 |
| Property Custodian Signature <i>[Signature]</i> | Extension/Pager 7534/2303 | Custodian Room/Cube 5B | Request Date 1/24/00 | |

| Line Item | Property Control Number | Serial Number | Description/Manufacturer/Model Number | Qty | Unit of Issue | Cond Code | Qty Rec'd | Storage Location | Date Rec'd | Rec'd By | FCC | Final Disp. |
|-----------|-------------------------|---------------|---------------------------------------|-----|---------------|-----------|-----------|------------------|------------|----------|-----|-------------|
| 01 | 0000380400 | | MOBILE OFFICE, 5 WIDE, | 1 | EA | \$ | 1 | 280 | | | | 7 |
| 02 | | | T112A | | | | | | | | | |
| 03 | | | | | | | | | | | | |
| 04 | | | | | | | | | | | | |
| 05 | | | | | | | | | | | | |
| 06 | | | | | | | | | | | | |
| 07 | | | | | | | | | | | | |
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|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| Unrestricted Property Release Approval The above described item(s) has been evaluated and/or Radiologically surveyed in accordance with RSP 9.01 and is approved for Unrestricted Release. Property Release Log No: 000124-T130B-01 P/WRE No: 000124-T130B-001 Employee No: [Redacted] <i>[Signature]</i> 1-24-00 Rad. Ops/Rad Eng Signature Date | | "High Risk" Review Certification <input type="checkbox"/> "No EC/Proliferation" Concern <input type="checkbox"/> "High Risk" Property <input type="checkbox"/> "Export Controlled" Property Export Control Officer Date | ADP Applicable Only These computer systems have met all security requirements as outlined in the appropriate ACSSO ₂ and "Computer User Handbook" (Classified and Unclassified) CSSO Print Name Employee No CSSO Signature Date | Certification for Removal of Hazardous Material <input type="checkbox"/> YES <input type="checkbox"/> NO If no, by signing below, I certify that all hazardous Material Constituents have been removed from the Property Signature Date | Final Disposition 1 - Transfer 2 - Gift 3 - Grant 4 - Sale 5 - Low Level Waste 6 - Donation 7 - Scrap |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|

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EXECUTIVE SUMMARY

A Reconnaissance Level Characterization (RLC) was performed to free-release trailer 112C and dispose of trailer 112A as waste. This RLC implements the Pre-Demolition (final status) survey design based upon the Multi-Agency Radiation Survey and Site Investigation Manual (NUREG-1575). Physical, chemical and radiological hazards were assessed based on historical reviews, process knowledge (Appendix 1), and newly acquired RLC data (Appendices 2-4). Results indicate no radioactive or chemical contamination exists and no significant physical hazards are present. Trailer 112A contains asbestos as part of the floor tile, which is considered an integral part of the structure. Based on the assessment, the trailers are confirmed to be Type I facilities and can either be free-released to commerce (i.e., for sale and re-use), or disposed of as waste.

ABBREVIATIONS/ACRONYMS

| | |
|---------------------|-------------------------------------------------------------------------|
| ACM | Asbestos containing material |
| ASD | Analytical Services Division |
| Be | Beryllium |
| CBDPP | Chronic Beryllium Disease Prevention Program |
| DCGL _{EMC} | Derived Concentration Guideline Level – elevated measurement comparison |
| DCGL _W | Derived Concentration Guideline Level – Wilcoxon Rank Sum Test |
| D&D | Decontamination and decommissioning |
| DDCP | Decontamination and Decommissioning Characterization Protocol |
| DOE | U.S. Department of Energy |
| DPP | Decommissioning Program Plan |
| DQA | Data quality assessment |
| DQOs | Data quality objectives |
| EPA | U.S. Environmental Protection Agency |
| FDPM | Facility Disposition Program Manual |
| K-H | Kaiser-Hill |
| LBP | Lead-based paint |
| LLW | Low-level waste |
| LSDW | Life safety disaster warning |
| MARSSIM | Multi-Agency Radiation Survey and Site Investigation Manual |
| MDA | Minimum detectable activity |
| MDC | Minimum detectable concentration |
| NRA | Non-Rad-Added Verification |
| OSHA | Occupational Safety and Health Administration |
| Pb | Lead |
| PARCC | Precision, accuracy, representativeness, comparability and completeness |
| PCBs | Polychlorinated biphenyls |
| PDS | Pre-Demolition Survey |
| RCRA | Resource Conservation and Recovery Act |
| RFCA | Rocky Flats Cleanup Agreement |
| RFETS | Rocky Flats Environmental Technology Site |
| RLC | Reconnaissance Level Characterization |
| RLCR | Reconnaissance Level Characterization Report |
| SVOCs | Semi-volatile organic compounds |
| TRU | Transuranic |
| TSCA | Toxic Substances Control Act |
| TSO | Transportation Security Office |
| VOCs | Volatile organic compounds |

1.0 INTRODUCTION

As part of the Rocky Flats Environmental Technology Site (RFETS) Closure Project, numerous buildings and structures will be removed. Among these are the trailers T112A and T112C, which are currently located in the Property Use and Disposition Yard near Building 280. These trailers no longer support the RFETS mission, and need to be removed to reduce Site infrastructure, risks and operating costs.

Before the trailers can be released, hazards must first be identified. Hazards identified will be used to plan final disposition. This document presents the existing physical, radiological and chemical hazards associated with the two trailers, and classifies the facilities pursuant to the RFETS Decommissioning Program Plan (DPP, K-H, 1998a). The hazards assessment is based on facility/process knowledge, operating and spill records, historical radiological and chemical data, and results of the RLC conducted. The RLC was conducted pursuant to the RFETS Decontamination and Decommissioning Characterization Protocol (DDCP). The content and outline of this report are consistent with the Kaiser-Hill (K-H) Facility Disposition Program Manual (FDPM, K-H, 1998b).

1.1 Purpose

The purpose of this report is to communicate and document the results of the RLC effort. The purpose includes both summarizing the data into concise, usable formats and interpreting the data for use in management decisions, primarily:

- Definition of individual hazards and overall risk associated with facility D&D;
- Typing of trailers based on hazards identified; and
- Ability to either free-release the trailers from the site, or dispose of them as waste.

1.2 Scope

This report covers physical, radiological and chemical characterization of T112A and T112C. Chemical characterization was conducted using Colorado Hazardous Waste Management regulations as a means to segregate materials as either hazardous or non-hazardous waste. Based on the hazards identified, the trailers were typed and assessed against free-release criteria.

2.0 OPERATING HISTORY AND PHYSICAL DESCRIPTION

2.1 Trailer 112A

This trailer was constructed/assembled at Central Avenue and Fourth Street, behind the northwest corner of Building 112, in the early 1960s. The size of this trailer is approximately 45' X 60' X 10', and it is assembled from 5 trailer units of approximately 12' X 45' feet in size. There are four doors leading into this trailer. The siding is enamel on aluminum. Structurally the trailer is sound; there are no leaks in the ceiling, and the outside is not damaged. The interior "outside" walls are wood paneling over insulation, the interior partition wall is wood paneling on stud framing, and the floor is carpet and sheet vinyl/linoleum on wood. The ceiling is a drop type with acoustical tile panels. The trailer has men and women restroom facilities. The men's restroom has a hot water heater for the facility. The trailer also has five electric heat pumps for heating and air conditioning. T-112A has a smoke detection system and was connected to the Plant fire alarm and life safety and disaster warning (LSDW) systems. No other equipment remains in the trailer.

On July 21, 1999, the trailer was separated into five separate units and transported to the site Property Utilization and Disposition yard near Bldg. 280. The units were positioned in their original configuration, with approximately 6 inches of separation between units. Some debris was removed.

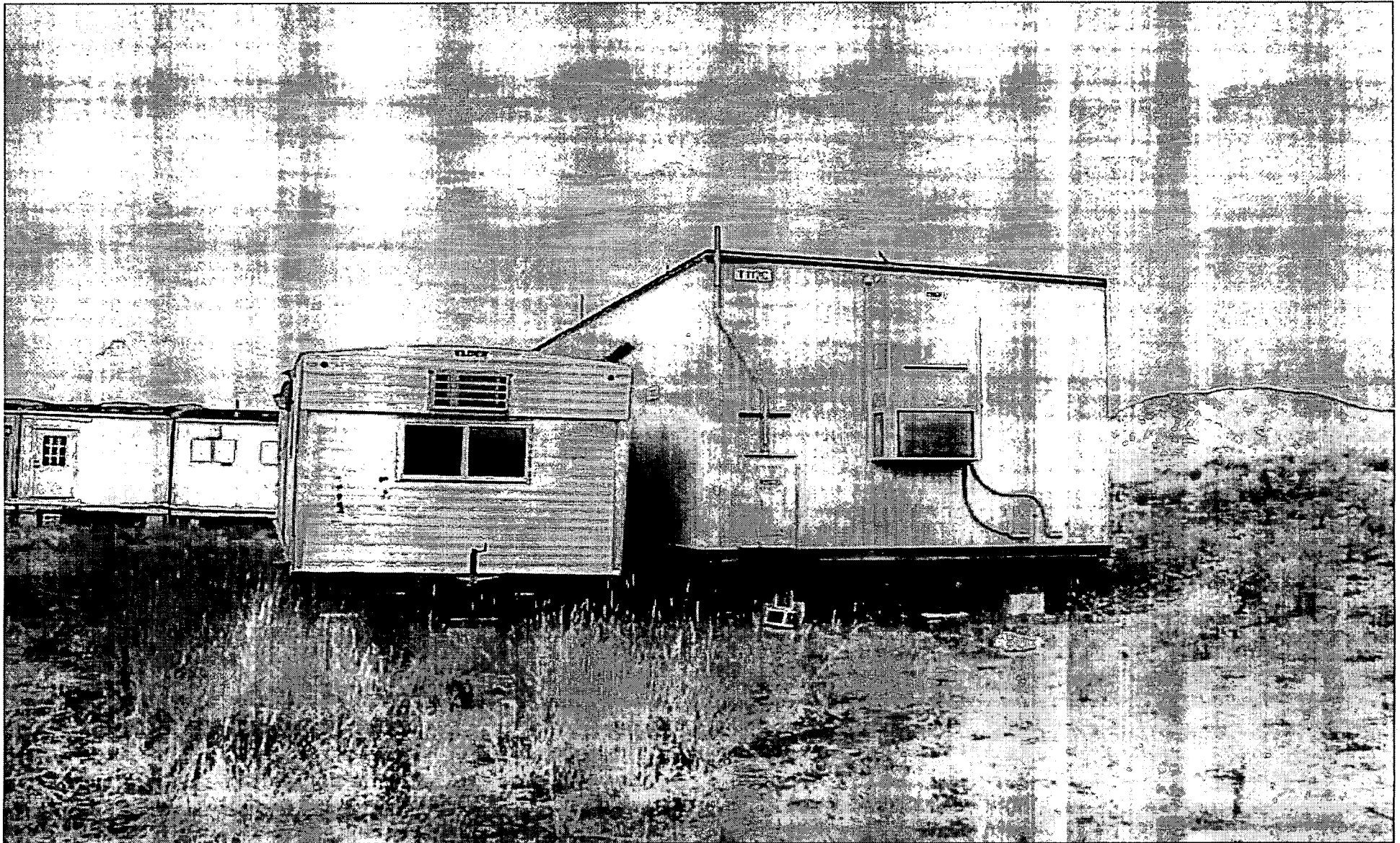
Prior to the Radio and Page Operations moving into T-112A, the south half of the trailer was used as a telecommunications office. The RFETS Traffic Department originally occupied the north section of T-112A. The south half of T-112A was a Company Store when the RFETS was managed and operated by Rockwell International (from approximately 1975 to 1990). Later the north section of T-112A was used by RFETS Transportation Security Office (TSO) Scheduling. Both the telecommunications and TSO groups vacated this trailer in March 1999. The trailer has remained unoccupied.

2.2 Trailer 112C

This trailer was brought onsite and placed at Central Avenue and Fourth Street in 1991. The size of this trailer is 14' - 0" X 60' - 3" X 13' - 10" at the roof edge. There are two doors leading into this trailer. The siding is enamel baked on aluminum. Structurally the outside has a panel that has been torn loose and part of it has blown away; inside, the condition is good. The interior "outside" walls are vinyl over 4' x 8' dry wall over insulation, the interior "partition" walls are the same materials on stud framing. The ceiling is a drop type with 2' x 4' acoustical tile panels and the floor is carpet over wood flooring. The trailer has an electric heat pump for heating and cooling and a fire sprinkler system, and it was connected to the Plant fire alarm and LSDW systems.

This trailer has been used as office space since it has been on site. There are six hard-walled rooms, of which five are offices. The sixth contains the telecommunication equipment and the fire sprinkler controls. The last occupant was Wackenhut Services which, used it as a scheduling office. They moved out in 1998. The trailer was moved to the site Property Utilization and Disposition Yard near Bldg. 280 on July 21, 1999. The trailer has remained unoccupied. Refer to Exhibit 2-1 for an exterior photograph of the trailers.

Exhibit 2-1 Exterior Photograph



3.0 SUMMARY OF CHARACTERIZATION ACTIVITIES

An RLC was designed to demonstrate that DOE-added radioactive materials are not present or have been removed from RFETS facilities to the extent that residual levels of contamination are below the Derived Concentration Guideline Levels (DCGLs) and that the trailers can either be free-released or disposed of as waste. This section of the RLC Report (RLCR) presents DQOs used, historical data, and additional RLC data needed to release the trailers. The section also describes the survey area and survey unit for the trailers, and defines the methods that were implemented in collecting radiological surveys, scans and samples. The survey followed the guidance provided in NUREG-1575, the Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM).

3.1 Data Quality Objectives

The following section outlines the DQO process used in designing the RLC Package.

The Problem

The problem involves quantifying the amount of material, media, equipment, floors, walls and ceilings, interior/exterior to the buildings and determining the extent of radiological and non-radiological contamination so that remaining floors, walls and ceilings can be free-released (i.e., no chemical and radiological hazards remain).

The Decision

The decision is verification that free-release and waste management standards have been met.

Inputs to the Decision

The input to the decision includes data from preceding characterizations, including historical data and process knowledge; data collected from this pre-demolition survey; and applicable action levels, free-release criteria, transportation requirements, waste management regulations, pollution prevention/waste minimization criteria, and waste acceptance criteria.

Decision Boundaries

The decision boundaries include the floors, walls, ceilings, roof and fixed equipment located in T112A and T112C.

Decision Rules

This section develops the rules to support the decisions regarding characterization data.

Radionuclides

- If process knowledge/history supports the premise that no radioactive contamination is present, and a pre-demolition survey has been performed and approved, the related area and/or volume is considered sanitary waste or may be free-released.
- If all radiological survey measurements are below the surface contamination thresholds provided in DOE Order 5400.5 (Radiation Protection of the Public and Environment) and/or are within background concentrations for volume contamination material (refer to Radiological Safety Practices 09.03, "Unrestricted Release of Build or Volume Material"), the related area or volume of material is considered sanitary waste or may be free-released.
- If all radiological sample measurements are below the volume contamination thresholds provided in the No-Rad-Added Verification (NRA) Program, the related volume of material is considered sanitary waste or may be free-released.
- If any radiological sample measurement exceeds the volume contamination threshold provided in the NRA Program, the associated volume must be remediated or disposed of as radiological or mixed waste.
- If any radiological survey measurement exceeds the surface contamination thresholds provided in the RFETS Radiological Control Manual, the associated surface area must be remediated or disposed of as radiological or mixed waste.
- If any radiological sample measurement (or disposal unit volume) exceeds 100 nanocuries per gram of transuranic material, the associated volume must be disposed of as transuranic (TRU) waste.

RCRA Constituents

If the waste is mixed with or contains a listed hazardous waste, or if the waste exhibits a characteristic of a hazardous waste, then the waste is considered RCRA-regulated hazardous waste in accordance with 6 CCR 1007-3, Part 261. If the waste is free from listed hazardous waste, and does not exhibit a characteristic of a hazardous waste, the waste is considered non-hazardous.

CERCLA Hazardous Substances

If the waste contains a listed hazardous substance above the CERCLA reportable quantity (40 CFR 302.40), notify the receiving disposal facility of the hazardous substance and estimated quantity prior to shipment.

Beryllium

If detectable beryllium contamination can be shown through process knowledge to consist of beryllium powder (P015 under RCRA), then the contaminated materials will be treated as RCRA waste and subject to treatment standards under 40 CFR 268.40.

If concentrations of beryllium are equal to or greater than $0.2 \text{ ug}/100 \text{ cm}^2$, the material is considered beryllium contaminated per the Occupational Safety and Industrial Hygiene Program Manual, Chapter 28, Chronic Beryllium Disease Prevention Program (CBDPP). If the concentrations are below $0.2 \text{ ug}/100 \text{ cm}^2$, the material is considered non-beryllium contaminated.

Polychlorinated Biphenyls (PCBs)

- If material meets the definition of "Bulk Product Waste," it may be disposed of as Toxic Substances Control Act (TSCA) waste at a permitted solid waste disposal facility without further characterization (Federal Register, Vol. 63, No. 124, June 29, 1998, 40 CFR §761.62,). If the disposal facility does not possess a commercial PCB storage or disposal approval, the generator must provide written notification to the facility in accordance with §762.62.
- If material meeting the definition of Bulk Product Waste is to be free-released (e.g., recycled), the 95% upper confidence limit of the mean value of a representative sample set cannot exceed 50 ppm. This determination can be made through process knowledge or laboratory analysis.
- If material meets the definition of PCB remediation waste (i.e., potentially containing PCBs from historical releases; §761.61), the free-release concentration is $\leq 1 \text{ ppm}$ PCBs, as determined in accordance with requirements of §761.61, Subpart G. Higher release levels for PCB remediation wastes are permissible, but carry specific restrictions on disposition of the material.

Asbestos

In accordance with 40 CFR 763 and 5 CCR 1001-10, if any one sample of a sample set representing a homogeneous medium results in a positive detection (i.e., $>1\%$ by volume), then material is considered Asbestos Containing Material (ACM); otherwise the material is considered non-ACM.

Tolerable Limits on Decision Error

The maximum value for false positive and false negative errors is 5% when calculating the number of samples required.

Optimization of Plan Design

Radiological characterization was conducted on interior floors, walls and ceilings, and exterior walls and roofs as necessary. The following criteria were used to develop the radiological survey/sampling characterization package:

- Radiological field measurement methods and instrumentation are described in Section 6 of MARSSIM.
- Radiological sampling and preparation for laboratory measurements are described in Section 7 of MARSSIM.
- For materials, media, equipment, floors, walls, and ceilings being released as low level and/or TRU waste, radiological surveys/samples are taken per Site Procedure 1-PRO-079-WGI-001, Waste Characterization, Generation and Packaging.
- If radiological survey/samples are required for materials, media and equipment for release as non-radioactive waste, then radiological surveying and sampling are conducted per the requirement in the RFETS HSP 18.10, Radioactive Material Transfer and Unrestricted Release of Property and Waste.
- If RCRA, TSCA or asbestos surveys/samples are required for materials, media, equipment, floors, walls and ceilings, Sampling and Analysis Plans are required per Section 6.0 of the D&D Characterization Protocol.

3.2 Radiological Characterization

Radiological characterization was performed to understand the nature and extent of radioactive materials that may be present in Trailers 112A and 112C. This section reviews the historical radiological data on these Trailers and discusses the RLC conducted. Radiological hazards and RLC data are discussed in Section 4.2, and RLC radiological data are presented in Appendices 2-4.

3.2.1 Summary of Historical Data

Historically, radiological surveys for T112A and T112C may have been performed, but the data are not readily available. There are no Plant Action Tracking System items outstanding on these trailers, which indicates no associated radiological program deficiencies. Trailers T112A and T112C are individually listed in I-P73-HSP-18.10, *Radioactive Material Transfer And Unrestricted Release Of Property And Waste, Appendix 4, Unrestricted Release Building/Facility List*. This listing authorizes the unrestricted release of administrative, non-hazardous property located in the trailers without radiological surveys or Radiological Safety signature for off-site shipment or transfer to PU&D, and is indicative of structures with a low probability of radioactive contamination. These assumptions do not directly apply to the trailer structures themselves, but does illustrate an area with a very low probability for radioactive contamination.

3.2.2 Summary of RLC Data Collected

Although historical review indicates no use of DOE radioactive material, insufficient quantitative radiological data exist to designate Trailers T112A and T112C as non-impacted pursuant to MARSSIM. Therefore, radiological surveys and scans were performed, and radioactive samples were taken and analyzed. Direct radiological surveys and scans were performed on the interior and exterior of both trailers for removable and total, alpha and beta contamination. Four radiological samples were taken from the roof of T112 A. The interior of T112A was designated as Survey Unit A, the exterior of T112A was designated as Survey Unit D, and the interior and exterior of T112C was designated as Survey Unit C.

3.2.3 Sampling and Field Measurement Methods, Procedures and Equipment

Total alpha and beta survey measurements were taken with the NE Electra using a DP-6 probe, and removable alpha and beta measurements were taken with the Eberline SAC-4 and BC-4, respectively. Radiological scans for total alpha and beta were taken with the NE Electra at a scan rate of 1.5 inches per second. Samples were screened on-site for alpha activity with the AP-2 and sent off-site for radiochemical analysis (alpha spectrometry). Radiological surveys, scans and samples were taken per the requirements of the *RFETS Radiological and Non-Radiological Trailer 112A-C Characterization Package, Revision 0* dated August, 1999 (refer to Appendix 5). All radiological samples were taken in accordance with Analytical Services Division (ASD) requirements.

A total of 64 measurements were taken within each survey unit. Each measurement and duplicate location was measured for total alpha, total beta, removable alpha, and removable beta). Twenty duplicate measurements were taken as well. The number of total surface and removable alpha measurements for floors, walls, ceilings, roofs, and fixed equipment were calculated based on MARSSIM statistical calculations. In addition, alpha scans of 10% of the total survey unit surface area were performed at biased (judgmental) locations on accessible surfaces. The scans were biased relative to those locations with the greatest potential for radioactive contamination based upon routine use of the trailer (i.e., "foot traffic"), and potential for exterior contamination (i.e., airborne fallout). The scan data were recorded as selected maximum values over the entire scan area of interest for the survey unit.

The appropriate number of survey points was calculated, and specific survey locations were selected using a random number generator. The actual measurements were taken at each grid intersection. If grid intersections (nodes) were inaccessible, the measurement was obtained as close as possible to the grid intersection, and the new location was annotated on the survey map.

Measurement locations were clearly identified by labels to provide a method of referencing survey results to survey measurement locations. These measurement locations were incorporated into a grid map at survey densities of 1 meter square.

Numerical results of this activity as well as statistical data analyses are detailed in the Appendices for each survey unit.

3.2.4 Laboratory Analysis

Radiological samples were analyzed per the requirements of the Final Sampling and Analysis Plan for Roofing Material from Trailers 112A and 112B for isotopic analysis dated July 21, 1999 (refer to Appendix 6). All radiological samples were analyzed in accordance with APO requirements.

Samples were managed to ensure an accurate record of sample collection, transport, analysis, and disposal. This management ensures that samples are neither lost nor tampered with and that the samples analyzed are traceable to a specific location in the field. Chain-of-custody documentation captures this process for all samples submitted for laboratory analysis. The chain-of-custody forms are included as part of survey documentation in Appendix 3 (Survey Unit D).

All samples collected for RFETS laboratories or approved contracted laboratories were analyzed via a Site-approved method. Individuals trained to use appropriate equipment and procedures performed the analyses. The laboratories selected have sufficient analytical capabilities for the radionuclides of interest (plutonium, americium, and uranium) and an established quality assurance/quality control program that assures the validity of the analytical results. The laboratory analytical methods used are capable of measuring levels at or below 50% of the established release criteria. All results state the detection limit for the analysis. Results are detailed in the Appendices for each individual survey unit.

3.3 Chemical Characterization

Chemical characterization was performed to determine the nature and extent of chemical contamination that may be present in Trailers 112A and C. Characterization was based on a review of historical and process knowledge and is presented in this section. Related hazards are discussed in Section 4.3.

3.3.1 Summary of Historical Data

Information on contaminants of concern (i.e., asbestos, beryllium, RCRA constituents, lead in paint, and PCBs) is presented below.

Asbestos: Historical asbestos inspection data exist for T112A. Thirteen samples of floor tiles, wall, and ceiling material were taken in T112A, and of these, four floor tile samples were determined to be asbestos-containing.

T112C underwent asbestos inspection in 1994, and nine samples of resin, paint, and plaster were taken. None were found to be asbestos-containing.

Beryllium: There is no record of beryllium operations or storage being conducted in the two trailers (*D&D Facility Characterization Interview Checklist, Facility Checklist, HRR Manager's Report, and List of Known Beryllium Areas*).

The CBDPP conducted an independent beryllium survey of T112A, which confirmed the absence of detectable beryllium contamination. Beryllium smears were collected at five locations in T112A. All results were below the detection limit of $0.1 \mu\text{g}/100 \text{ cm}^2$. The action level for beryllium surface contamination is $0.2 \mu\text{g}/100 \text{ cm}^2$. In light of the known history of the trailers, the CBDPP assumes that these results were representative of both trailers. No additional sampling for beryllium was conducted.

RCRA/CERCLA Constituents (including metals and VOCs/SVOCs): According to historical and process knowledge, no chemicals were used or stored in any of the two trailers (*D&D Facility Characterization Interview Checklist and Attached Facility Checklist and HRR Manager's Report*). Therefore, sampling for chemical contaminants is unnecessary and was not conducted.

Lead in paint: Paint on the interior and exterior surfaces of the trailers and wooden stairs and platforms was not characterized for Pb in paint. Environmental Waste Compliance Guidance #27, *Lead-based Paint (LBP) and Lead-based Paint Debris Disposal*, has directed that LBP debris generated outside of high contamination areas shall be managed as non-hazardous (solid) wastes and need not be sampled unless the potentially lead-containing component is to be scabbled or otherwise comprise a separate waste stream. Therefore, analysis for lead in paint was not required.

Polychlorinated Biphenyls: A high voltage electrical power transformer is mounted on a concrete pad outside the southwest corner of T112A, and is labelled "No PCBs." There is no record of PCB product use or storage in either of the trailers (*D&D Facility Characterization Interview Checklist, Facility Checklist, and HRR Manager's Report*). Therefore, analysis for PCBs within the trailers is unnecessary and was not conducted.

Environmental Waste Compliance Guidance #25, *Management of Polychlorinated Biphenyls (PCBs) in Paint and Other Bulk Product Waste During Facility Disposition*, has directed that applied dried paints, varnishes, waxes, or other similar coatings or sealants are acceptable for disposal (with notification) in a non-hazardous solid waste landfill as PCB Bulk Product Waste under 40 CFR 761.3 and 40 CFR 761.62 paragraph (b) and therefore need not be sampled as long as restrictions outlined in 40 CFR 761.62 regarding their disposition are met.

The exterior surfaces of the trailers are painted tan. The interior surfaces of each trailer are covered with paneling. Historical data and process knowledge give no reason to suspect that any specialized paints or coatings associated with PCBs were applied to the trailers. Therefore, the trailers were not characterized for PCBs in paint.

Fluorescent light ballasts were inspected by a site electrician. Several PCB-containing ballasts were discovered in T112A, two of which showed evidence of minor internal

leakage within the lighting unit, above the faceplate. None were discovered in T112C. All PCB-containing ballasts were removed. No further characterization was required.

3.3.2 Summary of RLC Data Collected

An asbestos inspection was conducted by a CDPHE-certified asbestos inspector. A single sample of roofing material was collected from Trailer 112A. Visual inspections of the trailers' roofs, interior and exterior panels, walls, and floors revealed no evidence of chemical spills or releases (i.e., stains, discoloration, odors, or other physical characteristics). Based on historical information presented in Section 3.3.1 and the inspections conducted, the only additional RLC data required was the sample collected for asbestos analysis from Trailer 112A.

4.0 HAZARDS

4.1 Physical Hazards

Current physical hazards associated with the Trailers T112 A and T112C consist of those common to standard industrial environments. The trailers are not connected to any utilities, such as electricity and gas. Physical hazards are controlled by the Site Safety and Industrial Hygiene Program, which is based on OSHA regulations and standard industry practices.

4.2 Radiological Hazards

Based on historical knowledge and the RLC, Trailers T112A and T112C are classified as MARSSIM Unimpacted Class 3 (i.e., Type I pursuant to the DPP). These trailers do not contain radiological contamination above the free-release limits prescribed in DOE Order 5400.5 and the RFETS Radiological Control Manual. Survey results were below DCGLs (refer to Table 4-1), as were all scans. The two T112A roof samples were also below the total and removable alpha DCGLs (refer to Table 4-2). RLC data are presented in Appendices 2-4, by survey unit, for removable alpha, removable beta, total alpha and total beta, each in separate tables. Appendix 2 presents data for Survey Unit A, which includes the interior of T112 A. Appendix 3 presents data for Survey Unit D, which includes the exterior of T112 A. Appendix 4 presents data for Survey Unit C, which includes the interior and exterior of T112 C.

4.3 Chemical Hazards

For each trailer, the potential for a hazard due to each of the following contaminants was considered:

- Asbestos.
- Beryllium;
- Lead and other metals;
- VOCs/SVOCs;
- PCBs.

The need for analysis of each potential hazard was evaluated based upon historical and process knowledge, given that the trailers were used exclusively for administrative purposes. The chemical hazards are summarized in Table 4-3.

4.3.1 Asbestos

Historical asbestos data indicated that four floor tile samples in T112A contain asbestos. The inspection conducted as part of RLC also determined that the flooring cement contains ACM.

Additionally, a sample of roofing material consisting of gray plaster was taken at the junction of two trailer units. This material was presumably used to seal the trailer units

together at their junctions, and contained a brown resinous material as well as some of the silver/black paint which covered the roof. This sample contained chrysotile asbestos in both the plaster and paint layers. However, all of the asbestos-containing material in the trailer was non-friable and therefore does not constitute a hazard.

Historical asbestos data indicate that no asbestos is present in T112C (refer to Section 3.3.1).

Table 4-1 Summary of Radiological Survey Data

| | | Removable Contamination ¹ | | | | Total Contamination ¹ | | | |
|-------------------------------------------|----|--------------------------------------|------|---------------------------------|------|----------------------------------|------|---------------------------------|--------|
| | | Alpha (dpm/100 cm ²) | | Beta (dpm/100 cm ²) | | Alpha (dpm/100 cm ²) | | Beta (dpm/100 cm ²) | |
| | | DCGL ¹ | | 1000 | | 100 | | 5000 | |
| | | Min. | Max | Min. | Max. | Min. | Max | Min. | Max |
| T112A Interior Survey Unit A | 16 | 0.0 | 3.0 | -44.0 | 28.0 | -14.0 | 5.0 | -845.0 | -277.0 |
| T112A Exterior Survey Unit D | 16 | 0.0 | 10.6 | -60.0 | 44.0 | 10.0 | 90.0 | -256.0 | 336.0 |
| T112C Interior and Exterior Survey Unit C | 16 | 0.0 | 4.5 | -40.0 | 40.0 | 4.0 | 94.0 | -364.0 | 281.0 |

Table 4-2 Radiological Sample Results for T112A Roof

| ROOF CENTER | | | | | |
|-------------|---------------------------|-------------|----------------------------------------------|-----------------------------------------|---------------------------------------------|
| ISOTOPE | Reported Activity (pCi/g) | MDA (pCi/g) | Converted Activity (dpm/100cm ²) | Converted MDA (dpm/100cm ²) | DCGL ¹ (dpm/100cm ²) |
| U-233/234 | 0.264 | 0.034 | 6.8 | 0.9 | 1000 |
| U-235 | 0.016 | 0.042 | 0.4 | 1.1 | 1000 |
| U-238 | 0.270 | 0.050 | 7.0 | 1.3 | 1000 |
| Pu-239/240 | 0.000 | 0.045 | 0.0 | 1.2 | 20 |
| Am-241 | 0.000 | 0.086 | 0.0 | 2.2 | 20 |

| SW CORNER | | | | | |
|------------|---------------------------|-------------|----------------------------------------------|-----------------------------------------|---------------------------------------------|
| ISOTOPE | Reported Activity (pCi/g) | MDA (pCi/g) | Converted Activity (dpm/100cm ²) | Converted MDA (dpm/100cm ²) | DCGL ¹ (dpm/100cm ²) |
| U-233/234 | 0.259 | 0.072 | 6.0 | 1.7 | 1000 |
| U-235 | 0.000 | 0.043 | 0.0 | 1.0 | 1000 |
| U-238 | 0.332 | 0.035 | 7.7 | 0.8 | 1000 |
| Pu-239/240 | 0.017 | 0.045 | 0.4 | 1.0 | 20 |
| Am-241 | 0.000 | 0.053 | 0.0 | 1.2 | 20 |

¹ DCGL – Derived Concentration Guideline Level

4.3.2 Metals (including beryllium and lead in paint)

According to historical and process knowledge, no metals, including beryllium and lead, were used or stored in the two trailers, and therefore, no related hazards are present.

4.3.3 VOCs/SVOCs

According to historical and process knowledge, no chemicals were used or stored in either of the trailers, and therefore, no related hazards are present.

4.3.4 PCBs

All PCB-containing ballasts have been removed. There is no record of PCB product use or storage in any of the trailers, and therefore, no related hazards are present.

Table 4-3 Summary of T112A and T112C Chemical Hazards

| Contaminant of Concern | Analysis | Historical or RLC? | Below release limit or regulatory thresholds? |
|------------------------|------------------------------------------------------------------------------------------------------------------------------|--------------------|-----------------------------------------------|
| Asbestos | Four floor tile samples in T112A were determined to contain asbestos in the mastic. | Historical | Yes ¹ . |
| | Cove base cement in T112A was assumed asbestos-containing. | RLC | |
| | A sample of T112A roofing material contained asbestos. | RLC | |
| | No asbestos was detected in T112C. | Historical | |
| Beryllium | Surface smears in T112A (considered representative of T112A and T112C due to trailers being used solely for administration). | Historical | Yes. |
| VOCs/SVOCs | No history of use or storage. No characterization was required. | Historical | Yes. |
| Lead in paint | No characterization has been performed. | Historical | Yes ² . |
| PCBs | All PCB ballasts have been removed, including two in T112A which were potentially leaking inside the face plate. | Historical | Yes ³ . |
| | No specialized paints or coatings were observed. No characterization for PCB in paint was performed. | | |

- 1 Notification of the State and of the waste disposal facility of the presence of non-friable asbestos is required.
- 2 Environmental Waste Compliance Guidance #27, *Lead-based Paint (LBP) and Lead-based Paint Debris Disposal*, has directed that LBP debris generated outside of currently identified high contamination areas shall be managed as non-hazardous (solid) wastes and need not be sampled unless the potentially lead-containing component is to be scabbled or otherwise comprise a separate waste stream.
- 3 Environmental Waste Compliance Guidance #25, *Management of Polychlorinated Biphenyls (PCBs) in Paint and Other Bulk Product Waste During Facility Disposition*, has directed that applied dried paints, varnishes, waxes, or other similar coatings or sealants are acceptable for disposal (with notification) in a non-hazardous solid waste landfill as PCB Bulk Product Waste under 40 CFR 761.3 and 40 CFR 761.62 paragraph (b) and therefore need not be sampled as long as restrictions outlined in 40 CFR 761.62 regarding their disposal are met.

5.0 DATA QUALITY ASSESSMENT (DQA)

Data used in making disposition decisions must be of adequate quality. Adequate data quality for decision-making is required by applicable RMRS and K-H corporate policies (RMRS, 1998, §6.4 and K-H, 1997, §7.1.4 and 7.2.2), as well as by the customer (DOE, RFFO; Order O 414.1, Quality Assurance, §4.b.(2)(b)). Regulators and the public also expect decisions and data that are technically and legally defensible. Verification and validation of the data ensure that data used in decisions resulting from the RLC are usable and defensible.

The DQA consists of revisiting the DQOs used and determining whether those objectives were met. This data evaluation also consisted of verifying and validating the RLC data, which ensures that data input into decisions are accurate, precise, representative, complete, and comparable. Because only radiological data were collected for the project (i.e., no chemical surveys or samples were required), the DQA addresses only radiological survey and sample results.

Many of the DOE quality elements of Order 414.1 are inherent within the MARSSIM guidance, as DOE was a co-author of MARSSIM. The RLC for trailers 112A and 112C was conducted in accordance with the FDPM and the DDCP. These programs exist within the Site's DOE approved QA Program which accommodate applicable sections of NQA-1. Adequate implementation of the quality elements required by DOE Quality Assurance Order (414.1) was corroborated through the verification and validation process described within this section.

Original DQOs of the project are stated in §3.0. Problems, decisions, decision inputs, project boundaries, and error tolerances were adequately defined. Original estimates of sample types, quantities, and gridding locations/densities were confirmed by using statistics (vs. assumed values) derived from the actual data collected for the project.

The DQA presented in this section supports conclusions through implementation of the guidelines taken from the following MARSSIM sections:

- §4.9, Quality Control
- §8.2, Data Quality Assessment
- §9.0, Quality Assurance & Quality Control
- Appendix E, Assessment Phase of the Data Life Cycle
- Appendix N, Data Validation using Data Descriptors

The MARSSIM-recommended criteria for verification and validation of Pre-Demolition (final status) survey data, listed above, are summarized in Table 5-1. The MARSSIM criteria are listed across the top of the table whereas the project's proof of implementation is listed along the left-hand side of the table. One or more "checks" per column exhibit compliance with the MARSSIM criteria.

As stated previously, the decisions for both Trailers 112A and 112C are that contamination levels are below free-release criteria, for chemicals and radionuclides. The conclusion with respect to radiological contamination is derived with 95% confidence based on use of MARSSIM methodology in the survey units' design.

Table 5-1 Trailers 112A and C Survey Compliance with MARSSIM Data Quality Guidelines

Best Available Copy

5.1 VERIFICATION OF RESULTS

Verification ensures that data produced and used by the project are documented and traceable per quality requirements. Verification consisted of reviewing the project's data relative to three subsets:

1. Radiological scans,
2. Radiological static surveys for removable and total contamination, and
3. Radiochemical data resulting from samples taken and subsequently analyzed via alpha spectrometry.

Verification confirmed that:

- Chain-of-custody was intact from initial sampling through transport and final analysis;
- Preservation and hold-times were within tolerance;
- Format and content of the data are clearly presented relative to goals of the project, i.e., to determine, with at least 95% confidence, that the survey units of interest (T112A and T112C) are adequate for radiological free release.

Verification of the T112A and C Trailers RLC data also confirmed the presence of quality records representing implementation of the following quality controls:

- Calibrations (radiochemistry, surveys and scans), for accuracy;
- Laboratory control samples (LCS -- radiochemistry), for accuracy;
- Blanks (radiochemistry), for accuracy;
- Duplicate measurements (radiochemistry surveys and scans), for precision;
- Chemical yield (radiochemistry), for accuracy;
- Count times (radiochemistry surveys and scans), for sensitivity;
- Sample preparations (radiochemistry), for accuracy, representativeness.

Items requiring survey coverage were verified as follows:

- A grid survey map was developed for each survey unit.
- The grid survey maps served as an index of the subunits, and defined the subunit boundaries.
- Each grid survey map used to document Electra and Eberline surveys was reviewed against the trailer floor plan map for coverage.
- Because every grid survey map was correlated to a survey form, and all survey forms were inventoried via the survey summary sheet, 100% coverage of every subunit was assured.

Upon completion of the data management activities listed above, an independent peer review was performed on each survey package.

In summary, the verification confirmed that documentation and quality records are intact for the project, which in turn corroborates implementation of the required technical

quality controls and administrative requirements, particularly verification of those documents and records that will ultimately support the CERCLA Administrative Record. All relevant Quality records associated with T112A and T112C RLC decisions will be submitted to the RMRS Records Center for permanent storage within 30 days of the conclusion of the project.

5.2 VALIDATION OF RESULTS

Validation consisted of a technical review of all data that directly support the RLC decisions. Any limitations of the data relative to project goals are delineated, and the associated data are qualified accordingly. Data were validated relative to quality criteria discussed throughout previously noted MARSSIM sections and the PARCC parameters.

PARCC parameters are consistent with "data descriptors" in MARSSIM and address characteristics of the data that must be defined for scientific integrity and defensibility. The next section, which addresses the PARCC parameters -- Precision, Accuracy, Representativeness, Comparability, and Completeness, also include discussion on bias and sensitivity, two more data descriptors emphasized in MARSSIM.

Validation of analytical data to K-H contractual requirements (K-H Statements of Work) is currently performed on a site-wide basis at ~25% frequency by the K-H Analytical Services Division. Satisfactory validation at this frequency indicates that subcontracted laboratories are operating competently relative to industry-wide standards, and more specifically, that sample custody and analytical procedures are implemented under defined quality controls on a site-wide, programmatic basis. Site-wide data validation coupled with annual laboratory audits provide the inference that all analytical results not specifically validated are represented by the percentage that is validated. Radiochemistry performed for this RLC was verified as meeting K-H contractual requirements -- Module RC01-B.3 for alpha spectrometry (4/24/98 and Module 9, 7/6/98).

5.2.1 PRECISION

5.2.1.1 Radiological Surveys and Scans

Precision of the radiological instrumentation was satisfactory based on tolerance charting of daily source measurements for each individual sensor used on the project, which includes all measurement types (scans and static measures for total contamination and swipes for removable). Adequate precision was established through instrument performance within a $\pm 20\%$ range as defined by measurement results compared to a standard source value. Based on standard protocol (e.g., Procedures 1-P73-HSP-18.10, Radioactive Material Transfers and Unrestricted Release of Property and Waste, and 3-PRO-165-RSP-0702, Contamination Monitoring Requirements), any measurement exceeding the defined tolerance limits required corrective action (repair or replacement) prior to the instrument's use during pre-demolition survey.

Duplicate measurements were acquired for total and removable surface activity measurements at $\geq 30\%$ frequency per survey unit. All duplicate measurements were within tolerance based on the acceptance criterion that both results be below Derived Concentration Guideline Level-Averaged Measures (DCGL_W) (note: even if populations were "significantly" different between real and duplicate results, if both duplicate and real population statistics are less than action levels, the difference between duplicate and real values is, ultimately, insignificant relative to free-release decisions).

5.2.1.2 Radiochemistry

Results from laboratory duplicates indicate adequate lab precision based on duplicate results within statistical tolerance values ($>90\%$ confidence of equivalency between the original sample and the duplicate). Although field duplicate samples were not acquired for determination of overall project precision, agreement between the two samples to within a range less than the DCGL_W indicates that reproducibility is adequate for project decisions (i.e., relative to free-release of materials).

5.2.2 ACCURACY (and Bias)

5.2.2.1 Radiological Surveys and Scans

Accuracy of radiological surveys and scans is satisfactory based on RFETS-programmatic annual calibrations that establish instrument efficiencies and sensitivities for all instrumentation used on this project. Daily source checks also provided periodic checks to ensure that all sensors are within tolerance during daily operations. Calibration and calibration check results were within the RFETS and industry-standard requirement of 20% of the applicable reference standard values. Full-scale, multi-point calibrations provided accuracy of $\pm 10\%$ prior to implementation of survey instruments in the field, consistent with guidelines put forth in ANSI-N323.d

Total beta results for Survey Unit A may appear to be biased low based on the consistently negative values (with an arithmetic average of -519 dpm/100cm) for the Unit A sample set. However, based on the method by which local area backgrounds were attained relative to measurements acquired within the 112A Trailer, negative values can be expected. Local area backgrounds for the NE Electra DP6 were determined at approximately 3 ft above ground level outside the trailer location; probes were held face up at waist level and underwent a 1-minute count time. In contrast, trailer-interior measurements are acquired at relatively higher elevations (above grade), and are shielded from much exterior "shine" within the trailer. As a result, the high background and/or low instrument bias would not appear to impact Survey Unit decisions, as the levels are significantly lower than the free-release action levels (5000 dpm/100cm²).

Removable beta results might also appear to have a slight negative bias based on performance check results that are consistently below zero (i.e., within the negative acceptance range). Such instrument performance, when consistently below the standard reference values, suggests that instrument efficiency may need to be adjusted

upward for more accurate results. This is due to using an assumed minimum efficiency of 25% for BC 4s when actual efficiencies are higher. However, as discussed above, the magnitude of the negative values does not suggest a potential bias high enough to compromise survey unit decisions.

Several survey measurements for total alpha exceeded free-release levels, however, upon re-survey yielded results well below free-release levels. The re-survey results, which did not confirm the initial elevated values, indicate that initial results were false positives (i.e., initial readings were caused by naturally occurring radioactive progeny and were not DOE-added radionuclides of concern).

5.2.2.2 Radiochemistry

Accuracy of the radiochemical results were within tolerance and acceptable based on the associated results of laboratory control samples and calibrations at the laboratory. Preparation blanks also confirmed that no significant cross-contamination occurred in the analysis process. Uncertainties of the radiochemical results are quantified for each sample by both 2-sigma error (probabilistic) and total error (systematic + probabilistic). Uncertainties associated with the alpha-spectrometry analyses were within standard industry magnitudes.

5.2.3 REPRESENTATIVENESS

Samples, surveys and scans are representative based on the following criteria:

- Familiarity with facilities -- multiple walk-downs and collaborations by management and technical staff;
- Implementation of industry-standard chain-of-custody protocols;
- Compliance with sample preservation and hold times;
- Documented and (site) approved methods;
- Radiochemistry - (alpha spectrometry) via K-H Module RC01-B.3;
- Radiological surveys via *Contamination Monitoring Requirements* (3-PRO-165-RSP-07.02);

Quality Assurance assessments were limited to the DQA presented in this section; no other site assessments were performed.

5.2.4 COMPLETENESS

The data set for this project is complete, with respect to surveys scans, samples and associated quality records ("data packages") resulting from the characterization process. Table 6-2 summarizes the minimum required number of samples surveys/scans, the actual quantity of samples/surveys/scans to date, and whether DQOs were achieved.

Table 5-2 Data Completeness Summary

| Rad Measurement Type | Required # of Samples/ Surveys/Scans | Actual # of Samples/ Surveys/Scans | Comments |
|----------------------------------------------------|-------------------------------------------------|-----------------------------------------------|-----------------|
| Survey Unit A (T112A Interior) | | | |
| Eberline SAC-4 (removable alpha) | 13 | 16 | DQO achieved |
| Eberline BC-4 (removable beta) | 13 | 16 | DQO achieved |
| NE Electra (total alpha and beta) | 13 | 16 | DQO achieved |
| Survey Unit C (T112C Interior and Exterior) | | | |
| Eberline SAC-4 (removable alpha) | 13 | 16 | DQO achieved |
| Eberline BC-4 (removable beta) | 13 | 16 | DQO achieved |
| NE Electra (total alpha and beta) | 13 | 16 | DQO achieved |
| Survey Unit D (T112A Exterior) | | | |
| Eberline SAC-4 (removable alpha) | 13 | 16 | DQO achieved |
| Eberline BC-4 (removable beta) | 13 | 16 | DQO achieved |
| NE Electra (total alpha and beta) | 13 | 16 | DQO achieved |
| Radiochemical | 0 | 2 | DQO achieved |

Consistent with the DQO process, the sampling design was optimized through back-calculating actual measurement results (acquired during RLC) and comparing model output with original estimates. The Post Survey Removable Contamination Summary Statistics Calculation verification worksheets for each survey unit are included in Appendices 2,3 and 4. Use of actual sample/survey/scan (result) variances in MARSSIM's DQO model provided confirmation that an adequate number of samples/surveys/scans had been acquired. Inputs required for decision-making, as stated in the original (planning) DQOs, were acquired, including coverage of originally-planned, 3-dimensional boundaries of the structure. All radiological results are valid without qualification, and form data sets with adequate quantities and quality of data for free-release decisions on the three survey units (2 trailers) of interest.

5.2.5 COMPARABILITY

All results presented are comparable with radiological survey/scan and radiochemistry data on a site- and DOE-complex wide basis. This comparability is based on:

- Use of standardized engineering units in the reporting of measurement results

- Consistent sensitivities of measurements at approximately 50% or less of the $DCGL_W$ (approximately 50% or less of the $DCGL_{EMC}$ for scans)
- Use of site-approved procedures
- Systematic quality controls
- Thorough documentation of the planning, sampling/analysis process, and data reduction into formats designed for making decisions based on the project's original data quality objectives.

5.2.6 SENSITIVITY

Adequate sensitivities, in units of $dpm/100\text{ cm}^2$, were attained for all surveys/scans and radiochemical methods implemented based on minimum detectable activities (MDAs) at 50% of the transuranic $DCGL_W$ ($\leq 50\%$ $DCGL_{EMC}$ for scans). The nominal MDAs for each survey and radiochemical method are summarized as follows:

- Removable alpha contamination (Eberline SAC-4): $8.3\text{ dpm}/100\text{cm}^2$;
- Removable beta contamination (Eberline BC-4): $200\text{ dpm}/100\text{cm}^2$;
- Total alpha contamination (NE Electra): $49\text{ dpm}/100\text{cm}^2$;
- Total beta contamination (NE Electra): $351\text{ dpm}/100\text{cm}^2$;
- Radiochemistry (Alpha Spectrometry): $7.9\text{ dpm}/100\text{cm}^2$ (converted from 0.119 pCi/g).

5.2.7 OTHER QA ELEMENTS

All personnel performing activities affecting quality within the RLC project were qualified to perform their specific tasks. Suitable training and qualification documentation for personnel performing the work, from the laborers to technical professionals to management, is documented by the RMRS Training Department. In addition, Quality Assurance assessments were limited to the DQA presented in this section; no other site assessments were performed.

5.2.8 DQA SUMMARY

In summary, the data presented in this report have been verified and are qualified as valid and complete for comparison with free-release criteria (action levels) as stated in the DQOs. All media sampled, surveyed and scanned relative to both total and removable alpha activities, yielded results less than action levels for the associated contaminants of concern. Therefore, Survey Units A, C, and D meet the free-release criteria with the statistical confidence stated in this section and throughout the report.

6.0 CLASSIFICATION OF TRAILERS T112A and T112C

Based on the analysis of radiological, chemical and physical hazards, trailers T112A and T112C are classified as Type I Facilities (i.e., "free of contamination") pursuant to the RFETS Decommissioning Program Plan (DPP, K-H, 1998a). Classification was based on a review of historical and process knowledge, historical radiological and chemical data, and newly acquired RLC data. Results indicate no radioactive or chemical contamination exists and no significant physical hazards are present. Trailer 112A contains asbestos as part of the floor tile, which is considered an integral part of the structure.

7.0 REFERENCES

DOE/RFEO, CDPHE, EPA, 1996. Rocky Flats Cleanup Agreement (RFCA), July 19, 1996.

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K-H, 1997. "Kaiser-Hill Team Quality Assurance Program", Rev. 5, 12/97

K-H, 1998a. Decommissioning Program Plan, October 8, 1998.

K-H, 1998b. Facility Disposition Program Manual, MAN-076-FDPM.

K-H, 1999a. Decontamination and Decommissioning Characterization Protocol.

K-H, 1999b. Reconnaissance Level Characterization Plan

MARSSIM – Multi-Agency Radiation Survey and Site Investigation, 12/97 (NUREG-1575, EPA 402-R-97-016).

RFETS, D&D Facility Characterization Interview Checklist and Attached Facility Checklist and HRR Manager's Report

RFETS Chronic Beryllium Disease Prevention Program, "List of Known Beryllium Areas"

RFETS, Environmental Waste Compliance Guidance #25, *Management of Polychlorinated Biphenyls (PCBs) in Paint and Other Bulk Product Waste During Facility Disposition*

RFETS, Environmental Waste Compliance Guidance #27, *Lead-Based Paint (LBP) and Lead-Based Paint Debris Disposal*

RMRS, 1998. Quality Assurance Program Description, RMRS-QAPD-001, Rev. 2, 4/98

Appendix 1

Historical Site Assessment

Facility Summary

T112A - This unit has been unoccupied since 3/99, it is assembled from five Trailers. The unit was always used for office space, by either Plant Traffic, the Employee Store, Transportation Security, or Telecommunications offices. What is left inside are wall hung fire extinguishers, bolted to wall wooden bookshelves, toilet fixtures in the men/women restrooms, partitions, acoustical ceiling tiles, and the doors are hung. The exterior doors remains and have cipher locks. The exterior doors (4) have wooden weather protection porches. The interior and exterior is in good condition. On the east side of the trailer, approximately 2-3 feet away from the east wall, there is a utility pole, and at the southwest corner there is a de-energized transformer. These are physical hazards that will have to be worked around, when this unit is relocated. From all historical searches, interviews, and historical data located, there has never been any Radioactive material or chemicals stored inside of this trailer. Radiological survey data is not available. However, there is asbestos data available, that indicates there is asbestos containing material in the floor tile.

T112C - This unit has been unoccupied since 1998. It's a singlewide trailer always used as office space. Currently inside, are doors, acoustical ceiling tiles, partitions, wall hung fire extinguishers, and in a separate room there is telecommunication equipment and a fire water riser with controls. The unit is in good condition. However, some siding has been blown loose from the wind. From all historical searches, interviews, and other historical data located, there has never been any Radioactive material or chemical hazards found in any historical data, interviews, or other historical searches, and there are no physical hazards. However, the wood construction at both doors will have to be removed before the trailer is removed.

HISTORICAL FACILITY OVERVIEW FOR TRAILER T- 112A

- 1.0 This trailer was constructed/assembled at this site, Central Avenue and Fourth Street, behind the northwest corner of Building 112, in the early 1960s. The size of this trailer is approximately 45' X 60' and it is assembled from 5 trailer units of approximately 12' X 45' feet in size. There are four doors leading into this trailer, two on the east and two on the west. All of the entry doors are covered; the entry covers range in size from 4' X 4' to 6' X 6'. The siding and the skirting, which is approximately 28" high, around the bottom of the trailer are enamel on aluminum. Structurally the trailer is sound, there are no leaks in the ceiling and the outside has no damage. The foundation that this office trailer sets on is concrete blocks and the tie-down method for the unit is steel cable from the trailers I-beams secured to concrete caissons. The interior outside walls is wood paneling over insulation, the interior partition wall is wood paneling on stud framing, and the floor is carpet and sheet vinyl/linoleum on wood. The ceiling is a drop type with acoustical tile panels up to 12 feet long at various widths. All four doors on this trailer office facility have cipher locks on them.
- 2.0 Prior to the Radio & Pager Operations moving into T-112A, the south half was used for I&ET/Telecommunications offices. The Plant Traffic Department for Plant travel originally occupied the north section of T-112A. The south half of T-112A was a Company Store when the RFETS was operated by Rockwell International (from approximately 1975 to 1990). Later the north section of T-112A was used by Traffic's Transportation Security Office (TSO) Scheduling. Both the I&ET and TSO groups vacated this trailer office building in approximately March, 1999. The trailer has Men and Women restroom facilities. The Men's restroom has a hot water heater for the facility. No other equipment remains in the trailer. Some books and trash remain throughout inside of the trailer. At the present time this trailer is unoccupied and Unoccupied Signs have recently been added to the four entry doors of the facility.
- 3.0 The utilities for this trailer consist of electric heat pumps (5 total) for both heating and air conditioning. T-112A has a smoke detection system and is connected to the Plant Fire Alarm System. A high voltage electrical power transformer is mounted on a concrete pad outside the southwest corner of T-112A. There are no engineering drawings for this trailer. A room layout drawing for this unit is available. Photographs of the exterior and interior of T-112A are available. Radiological surveys may have been done, but data is not available. This trailer will be resurveyed to meet present standards for release. The plant stopped the use of lead based paint in 1989, this trailer, if painted before this date may have been painted with lead based paint. Asbestos characterization data exists for the T-112A Unit, according to Kevin Sheehan, X7250, T-452D. No chemicals were used or stored in this trailer. No WSRIC has been done on this trailer. There are no PATS outstanding on this trailer. (See the Facility Planning layout sketch and exterior/interior photographs behind Tab #13 in this Manual.)

Type 1 Facility Checklist

TYPE 1 FACILITY: Trailer (T112A)

CURRENT LANDLORD: RFCSS

DATE OF COMPLETION: 7/15/99

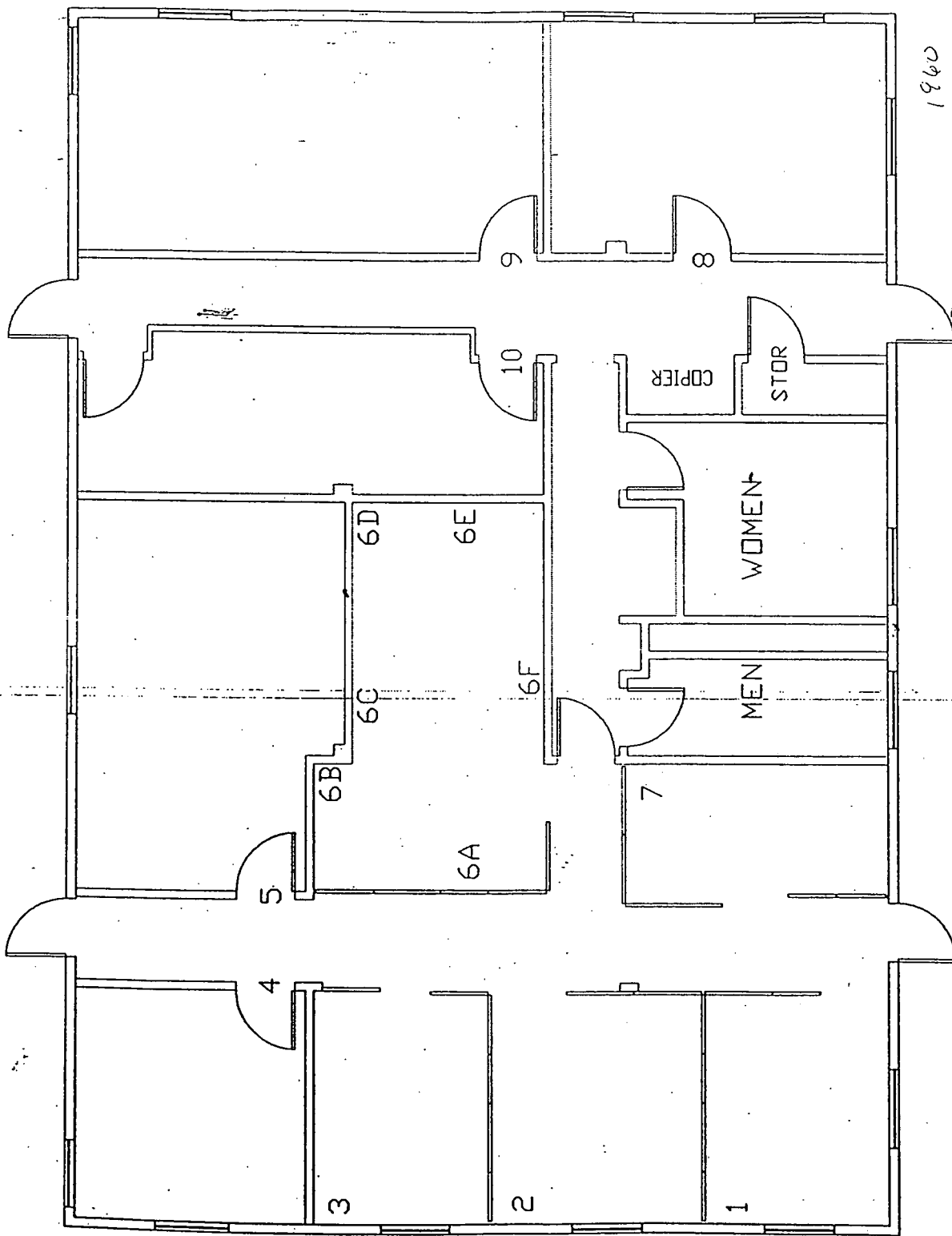
| ITEM | YES | NO |
|------------------------------------------------------------------------------------------------------------------------------------------|-----|----|
| Does the facility contain radiological postings? | | X |
| Does the facility contain chemical postings? | | X |
| Are there any installed hazards? | | X |
| Do the historical surveys (radiological and chemical) indicate that the facility is clean? | X | |
| Are there RCRA units within the facility? | | X |
| Is there a history of the building available? | X | |
| Is there any equipment/furniture left in the facility? Fire Extngrs., wooden book shelves bolted to walls, toilet fixtures, water heater | X | |
| Is there a future mission identified for the facility? | | X |
| Will the facility be left unsecured after it is vacated? | | X |

If any answer to any of the above questions is "Yes", complete the following questions and complete the "graded" PEP in accordance with chapter 2.

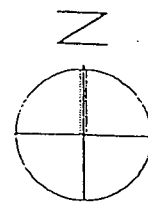
Note: An answer of "Yes" to any question, specifically one dealing with hazards, may indicate the facility is not a Type 1 Facility. Check with the D&D Programs office.

If the answer to all questions is "No" complete the "graded" PEP in accordance with Chapter 2.

- List the Radiological Hazards, location, and quantity: None
Based on Historical Data found and interviews taken, there are no RAD hazards in this trailer.
- List the Chemical Hazards, location, and quantity: None. Based on historical data and interviews taken, there are no chemical hazards in this trailer.
There is Asbestos Containing Material (ACM) in the floor tile.
- List the Physical Hazards:
Elec. power pole near middle of east wall and de-energized transformer at the Southwest corner

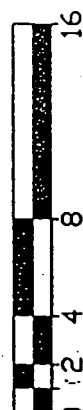


1960



DATE: 12-14-98

T-112A



HISTORICAL FACILITY OVERVIEW FOR TRAILER T-112C

- 1.0 This trailer was put in place at this site, Central Avenue and Fourth Street, in 1991. The size of Trailer T-112C is 14' - 0" X 60' - 3" X 13' - 10" at the roof edge (2' - 10" is skirting). There are two doors leading into this trailer on the south side with a cipher lock on the west one and a key lock on the east. The entryways are covered with wood panels. The west has wooden steps leading to it and the east has a truck dock and had a handicap access ramp that has been removed. The siding and the skirting around the bottom of the trailer are enamel baked on aluminum. Structurally the outside has a panel that has been torn loose and part of it has blown away, inside its condition is good. The interior outside walls is vinyl over 4' by 8' dry wall over insulation, the interior partition walls are the same materials on stud framing. The ceiling is a drop type with 2' by 4' acoustical tile panels and the floor is carpet over wood flooring.
- 2.0 This trailer has been used as offices all the time it has been on site. There are 6 hard walled rooms of which 5 are offices. The sixth contains the telecommunication equipment and the fire sprinkler controls. The last occupant was Wackenhut Services which, used it as a scheduling office. They moved out in 1998. At the present time the trailer is unoccupied and Unoccupied Signs have recently been added to the two doors of the facility.
- 3.0 The utilities for this building are an electric heat pump for heating and cooling, a fire sprinkler system, and it is connected to the plant fire alarm and PA systems. The drawings for this trailer consist only of a Facility Planning lay out sketch. Radiological surveys may have been done, but the data is not available. This unit will be resurveyed to meet present standards for release. Asbestos characterization data exists for the T-112C Unit, according to Kevin Sheehan, X7250, T-452D. The tie down method and the support structure underneath is unknown because of the skirting all around the bottom. The plant stopped the use of lead based paint in 1989. This trailer if painted before this date may have been painted with lead based paint. No chemicals were used or stored in this trailer. No WSRIC has been done on this trailer. There are no PATS outstanding on this trailer. (See the Facility Planning sketch behind Tab # 13 in this Manual. Plant site aerial photos and outside and inside photos are behind Tab #13.)

Type 1 Facility Checklist

TYPE 1 FACILITY: Trailer (T112C)

CURRENT LANDLORD: RFCSS

DATE OF COMPLETION: 7/15/99

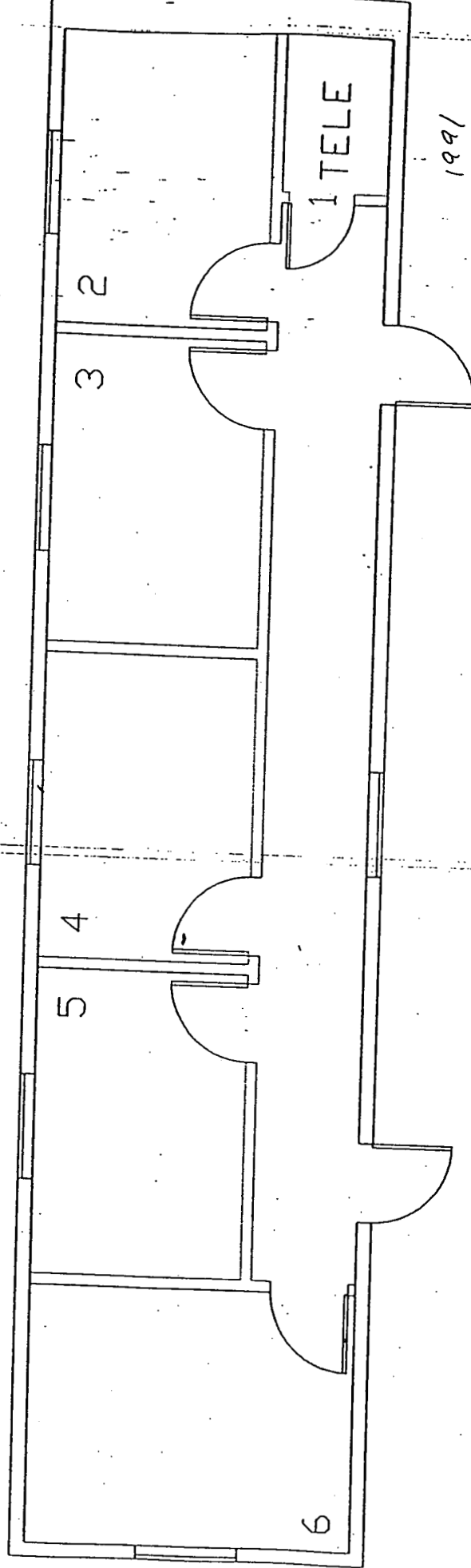
| ITEM | YES | NO |
|--------------------------------------------------------------------------------------------|-----|----|
| Does the facility contain radiological postings? | | X |
| Does the facility contain chemical postings? | | X |
| Are there any installed hazards? | | X |
| Do the historical surveys (radiological and chemical) indicate that the facility is clean? | X | |
| Are there RCRA units within the facility? | | X |
| Is there a history of the building available? | X | |
| Is there any equipment/furniture left in the facility? Fire Extgrs. | X | |
| Is there a future mission identified for the facility? | | X |
| Will the facility be left unsecured after it is vacated? | | X |

If any answer to any of the above questions is "Yes", complete the following questions and complete the "graded" PEP in accordance with chapter 2.

Note: An answer of "Yes" to any question, specifically one dealing with hazards, may indicate the facility is not a Type 1 Facility. Check with the D&D Programs office.

If the answer to all questions is "No" complete the "graded" PEP in accordance with Chapter 2.

1. List the Radiological Hazards, location, and quantity:
Based on Historical data found and interviews taken, there are no known RAD
Hazards in this trailer
2. List the Chemical Hazards, location, and quantity:
Based on Historical Data found and interviews taken, there are no known
Chemical hazards in this trailer
3. List the Physical Hazards:
None



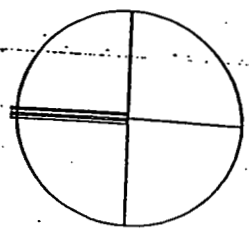
T-112C (WSI TRAINING)



0' 2' 4' 8' 16'

date: 12-14-98

NORTH



1784 - T-112B

Appendix 2

Radiological Survey Data for Interior of Trailer T112A (Survey Unit A)

Appendix 2

Radiological Survey Data for Interior of Trailer T112A (Survey Unit A)

APPENDIX 2 - Survey Unit A (Interior T112A)

- Survey Unit A Data Summary
- MARSSIM Calculation/Verification Worksheet
- Total and Removable Radiological Survey Results
- Performance Test Logs
- Survey Package Cover Sheet
- Sampling and Survey Instructions
- Grid Survey Maps

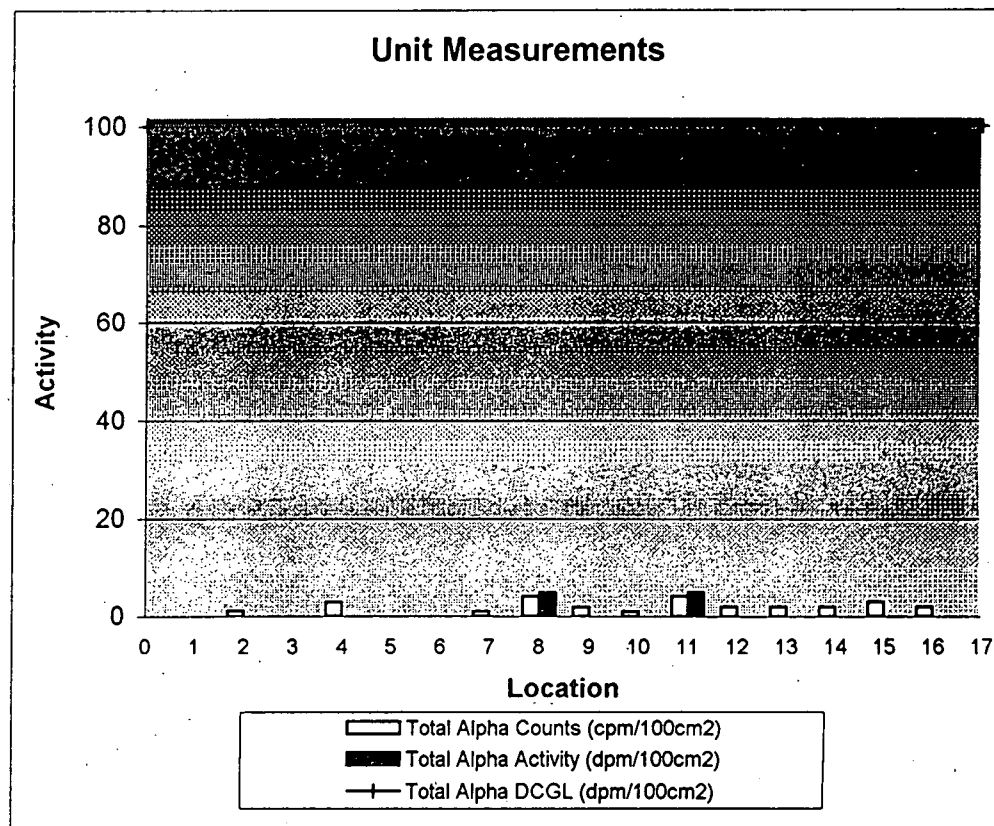
Total Alpha

Survey Unit A Data Summary - T112A Interior

August 18, 1999

| | | |
|------------------------------|------------|-------------------------------|
| standard deviation: 6.333772 | max: 5.0 | Instrument background: 3 cpm |
| mean: -6.125 | min: -14.0 | Instrument efficiency: 21.9 % |
| median: -5 | | Instrument MDA: 49 dpm |

| | Surface Location | | | Grid Location | Total Alpha Counts (cpm/100cm ²) | Total Alpha Activity (dpm/100cm ²) | Total Alpha DCGL (dpm/100cm ²) |
|----|------------------|----|---------|---------------|-------------------------------------------------|---------------------------------------------------|-----------------------------------------------|
| 1 | Room | 1 | Wall | I1 | 0 | -14 | 100 |
| 2 | Room | 2 | Wall | P2 | 1 | -9 | 100 |
| 3 | Room | 4 | Floor | A6 | 0 | -14 | 100 |
| 4 | Room | 4 | Ceiling | A4 | 3 | 0 | 100 |
| 5 | Room | 4 | Ceiling | A6 | 0 | -14 | 100 |
| 6 | Room | 5 | Wall | H2 | 0 | -14 | 100 |
| 7 | Room | 6 | Floor | A1 | 1 | -9 | 100 |
| 8 | Room | 6 | Ceiling | B1 | 4 | 5 | 100 |
| 9 | Room | 6 | Wall | H2 | 2 | -5 | 100 |
| 10 | Room | 8 | Wall | Q1 | 1 | -9 | 100 |
| 11 | Room | 8 | Wall | R2 | 4 | 5 | 100 |
| 12 | Room | 9 | Floor | A3 | 2 | -5 | 100 |
| 13 | Room | 9 | Ceiling | B4 | 2 | -5 | 100 |
| 14 | Room | 10 | Ceiling | C2 | 2 | -5 | 100 |
| 15 | Room | 11 | Wall | K1 | 3 | 0 | 100 |
| 16 | Room | 12 | Wall | K2 | 2 | -5 | 100 |



Total Beta

Survey Unit A Data Summary - T112A Interior

August 18, 1999

standard deviation: 169.876

max: -277.0

Instrument background: 495 cpm

mean: -518.5

min: -845.0

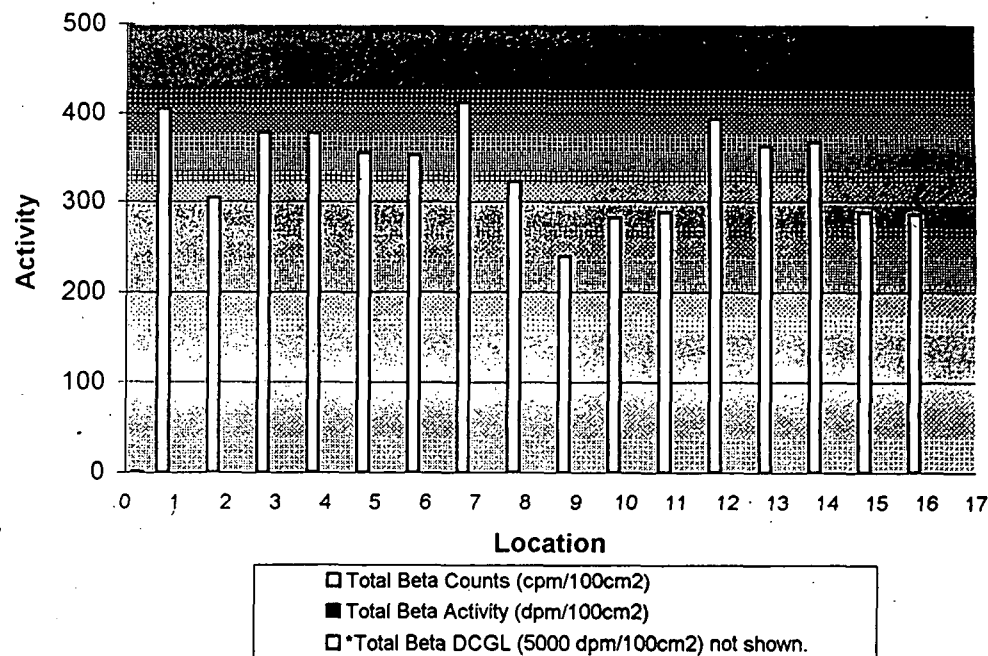
Instrument efficiency: 30.3 %

median: -468.5

Instrument MDA: 351 dpm

| | Surface Location | | | | Grid Location | Total Beta Counts (cpm/100cm ²) | Total Beta Activity (dpm/100cm ²) | Total Beta DCGL (dpm/100cm ²) |
|----|------------------|----|----------|--|---------------|------------------------------------------------|--------------------------------------------------|----------------------------------------------|
| 1 | Room | 1 | Wall | | I1 | 405 | -297 | 5000 |
| 2 | Room | 2 | Wall | | P2 | 304 | -630 | 5000 |
| 3 | Room | 4 | Floor | | A6 | 377 | -389 | 5000 |
| 4 | Room | 4 | Ceilling | | A4 | 376 | -393 | 5000 |
| 5 | Room | 4 | Ceilling | | A6 | 354 | -465 | 5000 |
| 6 | Room | 5 | Wall | | H2 | 352 | -472 | 5000 |
| 7 | Room | 6 | Floor | | A1 | 411 | -277 | 5000 |
| 8 | Room | 6 | Ceilling | | B1 | 322 | -571 | 5000 |
| 9 | Room | 6 | Wall | | H2 | 239 | -845 | 5000 |
| 10 | Room | 8 | Wall | | Q1 | 282 | -703 | 5000 |
| 11 | Room | 8 | Wall | | R2 | 288 | -683 | 5000 |
| 12 | Room | 9 | Floor | | A3 | 393 | -337 | 5000 |
| 13 | Room | 9 | Ceilling | | B4 | 362 | -439 | 5000 |
| 14 | Room | 10 | Ceilling | | C2 | 367 | -422 | 5000 |
| 15 | Room | 11 | Wall | | K1 | 288 | -683 | 5000 |
| 16 | Room | 12 | Wall | | K2 | 286 | -690 | 5000 |

Unit Measurements



Removable Alpha

Survey Unit A Data Summary - T112A Interior

August 18, 1999

standard deviation: 0.928709

max: 3.0

Instrument background: 0.2 cpm

mean: 0.5625

min: 0.0

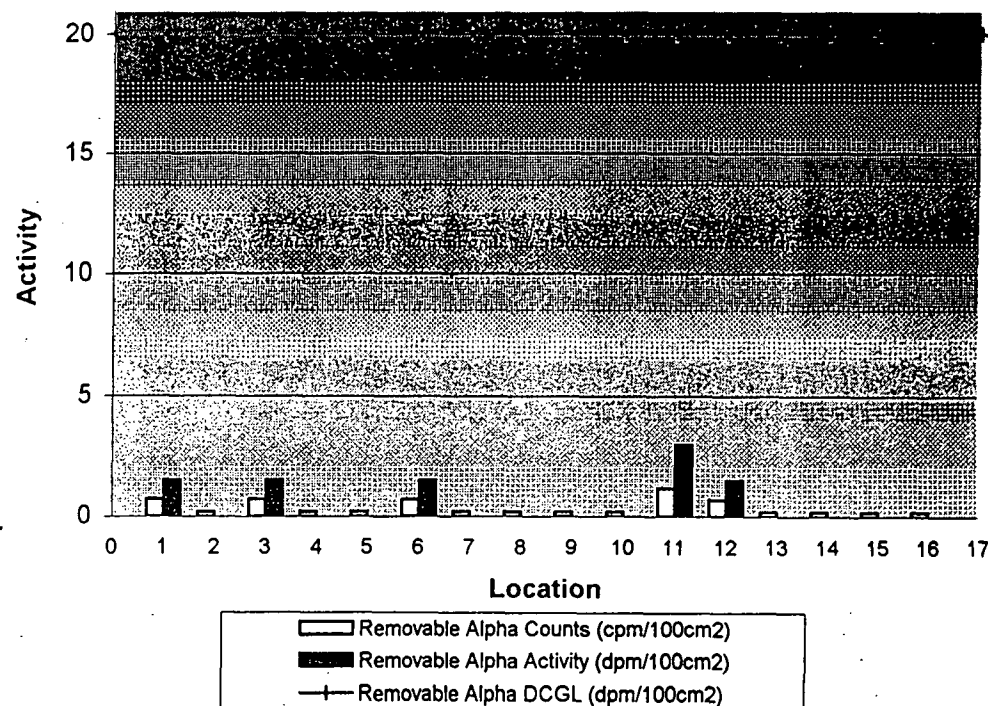
Instrument efficiency: 33 %

median: 0

Instrument MDA: 7.6 dpm

| Surface Location | | | | Grid Location | Removable Alpha Counts (cpm/100cm ²) | Removable Alpha Activity (dpm/100cm ²) | Removable Alpha DCGL (dpm/100cm ²) |
|------------------|------|----|----------|---------------|-----------------------------------------------------|-------------------------------------------------------|---------------------------------------------------|
| 1 | Room | 1 | Wall | I1 | 1 | 1.5 | 20 |
| 2 | Room | 2 | Wall | P2 | 0 | 0 | 20 |
| 3 | Room | 4 | Floor | A6 | 1 | 1.5 | 20 |
| 4 | Room | 4 | Ceilling | A4 | 0 | 0 | 20 |
| 5 | Room | 4 | Ceilling | A6 | 0 | 0 | 20 |
| 6 | Room | 5 | Wall | H2 | 1 | 1.5 | 20 |
| 7 | Room | 6 | Floor | A1 | 0 | 0 | 20 |
| 8 | Room | 6 | Ceilling | B1 | 0 | 0 | 20 |
| 9 | Room | 6 | Wall | H2 | 0 | 0 | 20 |
| 10 | Room | 8 | Wall | Q1 | 0 | 0 | 20 |
| 11 | Room | 8 | Wall | R2 | 1 | 3 | 20 |
| 12 | Room | 9 | Floor | A3 | 1 | 1.5 | 20 |
| 13 | Room | 9 | Ceilling | B4 | 0 | 0 | 20 |
| 14 | Room | 10 | Ceilling | C2 | 0 | 0 | 20 |
| 15 | Room | 11 | Wall | K1 | 0 | 0 | 20 |
| 16 | Room | 12 | Wall | K2 | 0 | 0 | 20 |

Unit Measurements



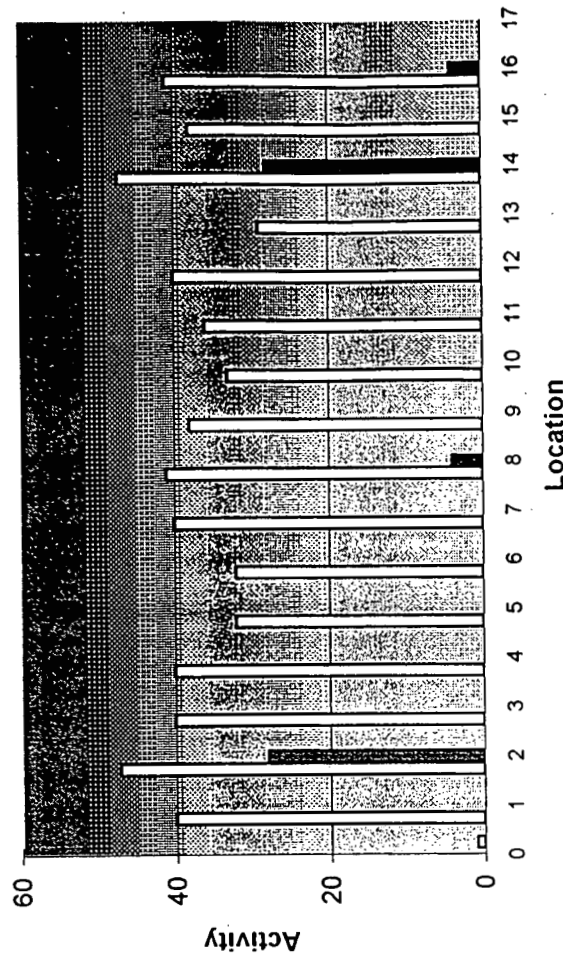
Removable Beta

Survey Unit A Data Summary - T112A Interior

| | | |
|------------------------------|------------|-------------------------------|
| standard deviation: 20.12627 | max: 28.0 | Instrument background: 40 cpm |
| mean: -6.5 | min: -44.0 | Instrument efficiency: 25 % |
| median: 0 | | Instrument MDA: 200 dpm |

| Surface Location | Grid Location | Removable Beta Counts (cpm/100cm ²) | Removable Beta Activity (dpm/100cm ²) | Removable Beta DCGL (dpm/100cm ²) |
|--------------------|---------------|-------------------------------------------------|---------------------------------------------------|-----------------------------------------------|
| 1 Room 1 Wall | I1 | 40 | 0 | 1000 |
| 2 Room 2 Wall | P2 | 47 | 28 | 1000 |
| 3 Room 4 Floor | A6 | 40 | 0 | 1000 |
| 4 Room 4 Ceiling | A4 | 40 | 0 | 1000 |
| 5 Room 4 Ceiling | A6 | 32 | -32 | 1000 |
| 6 Room 5 Wall | H2 | 32 | -32 | 1000 |
| 7 Room 6 Floor | A1 | 40 | 0 | 1000 |
| 8 Room 6 Ceiling | B1 | 41 | 4 | 1000 |
| 9 Room 6 Wall | H2 | 38 | -8 | 1000 |
| 10 Room 8 Wall | Q1 | 33 | -28 | 1000 |
| 11 Room 8 Wall | R2 | 36 | -16 | 1000 |
| 12 Room 9 Floor | A3 | 40 | 0 | 1000 |
| 13 Room 9 Ceiling | B4 | 29 | -44 | 1000 |
| 14 Room 10 Ceiling | C2 | 47 | 28 | 1000 |
| 15 Room 11 Wall | K1 | 38 | -8 | 1000 |
| 16 Room 12 Wall | K2 | 41 | 4 | 1000 |

Unit Measurements



- Removable Beta Counts (cpm/100cm²)
- Removable Beta Activity (dpm/100cm²)
- *Removable Beta DCGL (1000 dpm/100cm²) not shown.

Survey Area: T112**Building:** T112A**Survey Unit:** A (T112A Interior)

Post Survey Removable Contamination Summary Statistics Calculation Verification Worksheet

Step 1:

Conduct a preliminary data review: (the mean, standard deviation, and median of the Unit A removable surface contamination data are calculated on the "Survey Unit A Data" sheet. Because all removable survey measurement results are less than DCGL_w (alpha less than 20 dpm/100 cm², beta less than 1000 dpm/100 cm²), the survey unit clearly meets the removable contamination release criterion.

Step 2:

Select the statistical tests: The one-sample sign test was selected to assess the data, with $\alpha = 0.05$ and $\beta = 0.05$. The number of sample points calculated was based on the use of this test.

The performance of the sign test was not necessary due to the fact that each individual net result was less than the DCGL_w. Thus, the sign test would result in the rejection of the null hypothesis, and conclude that the median concentration of residual radioactivity in the survey unit is less than the DCGL_w.

Step 3:

Verify the assumptions of the test: The assumed data variance, as indicated by the assumed standard deviation was verified by re-calculating the required number of smears with the ACTUAL survey unit standard deviation.

The actual removable survey standard deviations for Unit A are: α 0.93 β 20.1

Thus, the ACTUAL required number of measurements is as follows:

α :

$$\Delta/\delta = (\text{DCGL}_{\text{REMOVABLE}} - \text{LBGR}_{\text{REMOVABLE}}) / \text{SD}_{\text{REMOVABLE}}$$

$$\Delta/\delta_{\text{transuranics}} = (20 \text{ dpm}/100\text{cm}^2 - 10 \text{ dpm}/100\text{cm}^2) / 0.93 \text{ dpm}/100\text{cm}^2 = 11$$

β :

$$\Delta/\delta = (\text{DCGL}_{\text{REMOVABLE}} - \text{LBGR}_{\text{REMOVABLE}}) / \text{SD}_{\text{REMOVABLE}}$$

$$\Delta/\delta_{\text{transuranics}} = (1000 \text{ dpm}/100\text{cm}^2 - 500 \text{ dpm}/100\text{cm}^2) / 20.1 \text{ dpm}/100\text{cm}^2 = 24.9$$

Where:

Δ/δ is the relative shift or the resolution of measurements in units of measurement uncertainty

$\text{DCGL}_{\text{REMOVABLE}}$ is the removable surface contamination derived concentration guideline value (DOE Order 5400.5 removable surface contamination limit equals 20 dpm/100cm² for transuranics per the T112A-C Pre Demolition Survey Plan)

$\text{LBGR}_{\text{REMOVABLE}}$ is the lower bound of the gray region – the lower bound of the range of values of the parameter of interest in a survey unit where the consequences of making a decision error is relatively minor (set equal to value utilized in original sample size calculation).

$\text{SD}_{\text{REMOVABLE}}$ is the ACTUAL standard deviation of the removable surface contamination measurements

Determine the Sign P value by looking up the relative shift (Δ/δ) in Table 5.4 of MARSSIM (the Sign P value is the estimated probability that a random measurement from the survey unit will be less than the DCGL when the survey unit median is actually at the LBGR). The Sign P value from Table 5.4, equals 0.998650 for a relative shift of 3.0 (The highest published value is utilized for conservatism).

Survey Area: T112**Building:** T112A**Survey Unit:** A (T112A Interior)**Post Survey Removable Contamination Summary Statistics Calculation Verification Worksheet****Step 3: Continued**

Determine the number of removable surface contamination measurements for the applicable survey unit using the following MARSSIM, Section 5.5.2.3 formula that is based on radioactive contaminants of concern not being present in the background:

 α

$$N = (1.645 + 1.645)^2 / 4(\text{Sign } P - 0.5)^2$$

$$N = (1.645 + 1.645)^2 / 4(0.998650 - 0.5)^2 = \underline{10.9}$$

 β

$$N = (1.645 + 1.645)^2 / 4(\text{Sign } P - 0.5)^2$$

$$N = (1.645 + 1.645)^2 / 4(0.998650 - 0.5)^2 = \underline{10.9}$$

Where:

1.645 is the alpha and beta decision error value (95% confidence) per the T112A-C Pre Demolition Survey Plan

Sign P equals 0.998650


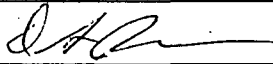

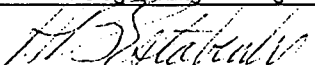
Step 4: Increase N by 20% to allow for missing or invalid data points per MARSSIM, Section 5.5.2.3.

$$N = \underline{10.9} * 1.2 = \underline{13}$$

Conclusion: Utilizing a conservative relative shift value of 3.0, a minimum of 13 α and β Removable Surface Contamination measurements were required in Unit A.

Step 4:

Draw conclusions from the data: All measurements are less than DCGL_w. The minimum number of required removable survey measurements were collected. Thus, survey unit Unit A complies with the removable contamination release criteria.

| | | | |
|---------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------|
| DAVID A. BARNES |  |  | 8-18-99 |
| Prepared By: Printed Name | Employee # | Radiological Engineer Signature | Date |
| M. J. P. [unclear] |  |  | 8/18/99 |
| Reviewed By: Printed Name | Employee # | Radiological Engineer Signature | Date |

Survey Area: T112

Building: T112A

Survey Unit: A (T112A Interior)

Post Survey Total Surface Activity Summary Statistics Calculation Verification Worksheet

Step 1:

Conduct a preliminary data review: (the mean, standard deviation, and median of the Unit A data are calculated on the "Survey Unit A Data" sheet. Because all total surface activity (TSA or TSC) measurement results are less than DCGL_w (less than 100 dpm/100 cm²), the survey unit clearly meets the TSA release criterion.

A graphical data review was also performed on the attached form. The posting plot indicated that spatial trends of elevated areas are not present. The histogram indicated that no isolated areas of elevated activity are present.

Step 2:

Select the statistical tests: The one-sample sign test was selected to assess the data, with $\alpha = 0.05$ and $\beta = 0.05$. The number of sample points calculated (see "Total Surface Activity Measurement Calculation Worksheet") was based on the use of this test. A local area background (LAB) value was subtracted from each gross measurement to calculate a net result, thus the sign test applies (sign test is typically applied only when the contaminant is not present in background).

The performance of the sign test was not necessary due to the fact that each individual net result was less than the DCGL_w. Thus, the sign test would result in the rejection of the null hypothesis, and conclude that the median concentration of residual radioactivity in the survey unit is less than the DCGL_w.

Step 3:

Verify the assumptions of the test: The assumed data variance, as indicated by the assumed standard deviation was verified by re-calculating the required number of samples with the ACTUAL survey unit standard deviation.

The actual total surface contamination standard deviations for Unit A are: α 6.3 β 170

Thus, the ACTUAL required number of samples is as follows:

$$\Delta/\delta = (DCGL_{TSA} - LBGR_{TSA}) / SD_{TSA}$$

α

$$\Delta/\delta_{transuranics} = (100 \text{ dpm}/100\text{cm}^2 - 50 \text{ dpm}/100\text{cm}^2) / 6.3 \text{ dpm}/100\text{cm}^2 = 7.9$$

β

$$\Delta/\delta_{transuranics} = (5000 \text{ dpm}/100\text{cm}^2 - 2500 \text{ dpm}/100\text{cm}^2) / 170 \text{ dpm}/100\text{cm}^2 = 316$$

Where:

Δ/δ is the relative shift or the resolution of measurements in units of measurement uncertainty

DCGL_{TSA} is the total surface Activity derived concentration guideline value (DOE Order 5400.5 total surface Activity limit equals 100 dpm/100cm² for transuranics and 5000 dpm/100cm² for uranium, per the T112A-C Pre Demolition Survey Plan)

LBGR_{TSA} is the lower bound of the gray region – the lower bound of the range of values of the parameter of interest in a survey unit where the consequences of making a decision error is relatively minor (set equal to the value utilized in the original sample size calculation).

SD_{TSA} is the ACTUAL standard deviation of the total surface Activity

Determine the Sign P value by looking up the relative shift (Δ/δ) in Table 5.4 of MARSSIM (the Sign P value is the estimated probability that a random measurement from the survey unit will be less than the DCGL when the survey unit median is actually at the LBGR). The Sign P value from Table 5.4, equals 0.998650 for a relative shift of 3.0 (The highest published value is utilized for conservatism).

Survey Area: T112**Building:** T112A**Survey Unit:** A (T112A Interior)

Post Survey Total Surface Activity Summary Statistics Calculation Verification Worksheet

Step 3: Continued

Determine the number of TSA surface Activity measurements for the applicable survey unit using the following MARSSIM, Section 5.5.2.3 formula that is based on Plutonium contaminants not being present in the background:

 α and β

$$N = (1.645 + 1.645)^2 / 4(\text{Sign } P - 0.5)^2$$

$$N = (1.645 + 1.645)^2 / 4(0.998650 - 0.5)^2 = 10.9$$

Where:

1.646 is the alpha and beta decision error value (95% confidence) per the T112A-C Pre Demolition Survey Plan

Sign P equals 0.998650

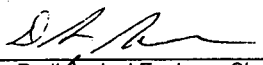
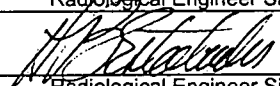
Step 4: Increase N by 20% to allow for missing or invalid data points per MARSSIM, Section 5.5.2.3.

$$N = 10.9 * 1.2 = 13$$

Conclusion: Utilizing a conservative relative shift value of 3.0, a minimum of 13 Total Surface Activity measurements were required in Unit A.

Step 4:

Draw conclusions from the data: All measurements are less than DCGL_w. The minimum number of required TSA measurements were collected. Thus, survey Unit A complies with the TSA release criteria.

| | | | |
|---------------------------|------------|--------------------------------------------------------------------------------------|---------|
| DAVID A. BARNES | |  | 8-18-99 |
| Prepared By: Printed Name | Employee # | Radiological Engineer Signature | Date |
| ESTABROOKS | |  | 8/24/99 |
| Reviewed By: Printed Name | Employee # | Radiological Engineer Signature | Date |

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

INSTRUMENT DATA

| | | |
|------------------|------------------|----------------|
| Mfg. Eberline | Mfg. Eberline | Mfg. Eberline |
| Model SAC-4 | Model SAC-4 | Model SAC-4 |
| Serial# 835 | Serial# 824 | Serial# N/A |
| Cal Due 10/26/99 | Cal Due 10/13/99 | Cal Due N/A |
| Bkg. 0.2 cpm | Bkg. 0.1 cpm | Bkg. N/A |
| Efficiency 33 % | Efficiency 33 % | Efficiency N/A |
| MDA 7.6 dpm | MDA 6.5 dpm | MDA N/A |

| | | |
|------------------|-----------------|------------------------|
| Mfg. Eberline | Mfg. Eberline | Mfg. NEtech |
| Model BC-4 | Model BC-4 | Model Electra |
| Serial# 700 | Serial# 770 | Serial# 1255 |
| Cal Due 10/22/99 | Cal Due 1/7/00 | Cal Due 9/16/99 |
| Bkg. 40 cpm | Bkg. 38 cpm | Bkg. 3 495 cpm |
| Efficiency 25 % | Efficiency 25 % | Efficiency 21.9 30.3 % |
| MDA 200 dpm | MDA 200 dpm | MDA 49 351 dpm |

Survey Type CONTAMINATION SURVEYBuilding: T112A InteriorLocation: 280 YardPurpose: MARSSIM Release SurveyRWP #: N/ADate: 08-11-99Time: 14:30RCT: Hersey

Print name

Signature

RCT: Espinoza

Print name

Signature

Emp. #

PRL #:

Comments: All results in scans were approx. equal to background except ave. points of each grid noted on page 2Alpha removable was a two minute count.

SURVEY RESULTS

| Swipe # | Location/Description (Results in DPM/100CM ²) | Removable | | Total | | Swipe # | Location/Description (Results in DPM/100CM ²) | Removable | | Total | |
|---------|--------------------------------------------------------------|-----------|------|-------|------|---------|--------------------------------------------------------------|-----------|------|-------|------|
| | | Alpha | Beta | Alpha | Beta | | | Alpha | Beta | Alpha | Beta |
| 1 | T112A ROOM 1 WALL I2 | <7.6 | <200 | <49 | <351 | QA #3 | | | | <49 | <351 |
| 2 | T112A ROOM 2 WALL P2 | <7.6 | <200 | <49 | <351 | QA #7 | | | | <49 | <351 |
| 3 | T112A ROOM 4 FLOOR A6 * | <7.6 | <200 | <49 | <351 | QA #11 | | N/A | | <49 | <351 |
| 4 | T112A ROOM 4 CEILING A4 | <7.6 | <200 | <49 | <351 | QA #12 | | | | <49 | <351 |
| 5 | T112A ROOM 4 CEILING A6 | <7.6 | <200 | <49 | <351 | QA #15 | | | | <49 | <351 |
| 6 | T112A ROOM 5 WALL H2 | <7.6 | <200 | <49 | <351 | | | | | | |
| 7 | T112A ROOM 6 FLOOR A1 * | <7.6 | <200 | <49 | <351 | | | | | | |
| 8 | T112A ROOM 6 CEILING B1 | <7.6 | <200 | <49 | <351 | | | | | | |
| 9 | T112A ROOM 6 WALL H2 | <7.6 | <200 | <49 | <351 | | | | | | |
| 10 | T112A ROOM8 WALL Q1 | <7.6 | <200 | <49 | <351 | | | | | | |
| 11 | T112A ROOM R2 * | <7.6 | <200 | <49 | <351 | | | | | | |
| 12 | T112A ROOM 9 FLOOR A3 * | <7.6 | <200 | <49 | <351 | | | | | | |
| 13 | T112A ROOM 9 CEILING B4 | <7.6 | <200 | <49 | <351 | | | | | | |
| 14 | T112A ROOM 10 CEILING C2 | <7.6 | <200 | <49 | <351 | | | | | | |
| 15 | T112A ROOM 11 WALL K1 * | <7.6 | <200 | <49 | <351 | | | | | | |
| 16 | T112A ROOM 12 WALL K2 | <7.6 | <200 | <49 | <351 | | | | | | |
| | N/A | | | | | | | | | | |

ate Reviewed: 8/13/99RS Supervision: S. East

Print Name

Signature

Emp.

T112A interior MDA

RADIOLOGICAL SAFETY

Continuation Sheet

SURVEY RESULTS

Date Reviewed:

8/13/99

RS Supervision:

Print Name _____

Signature _____

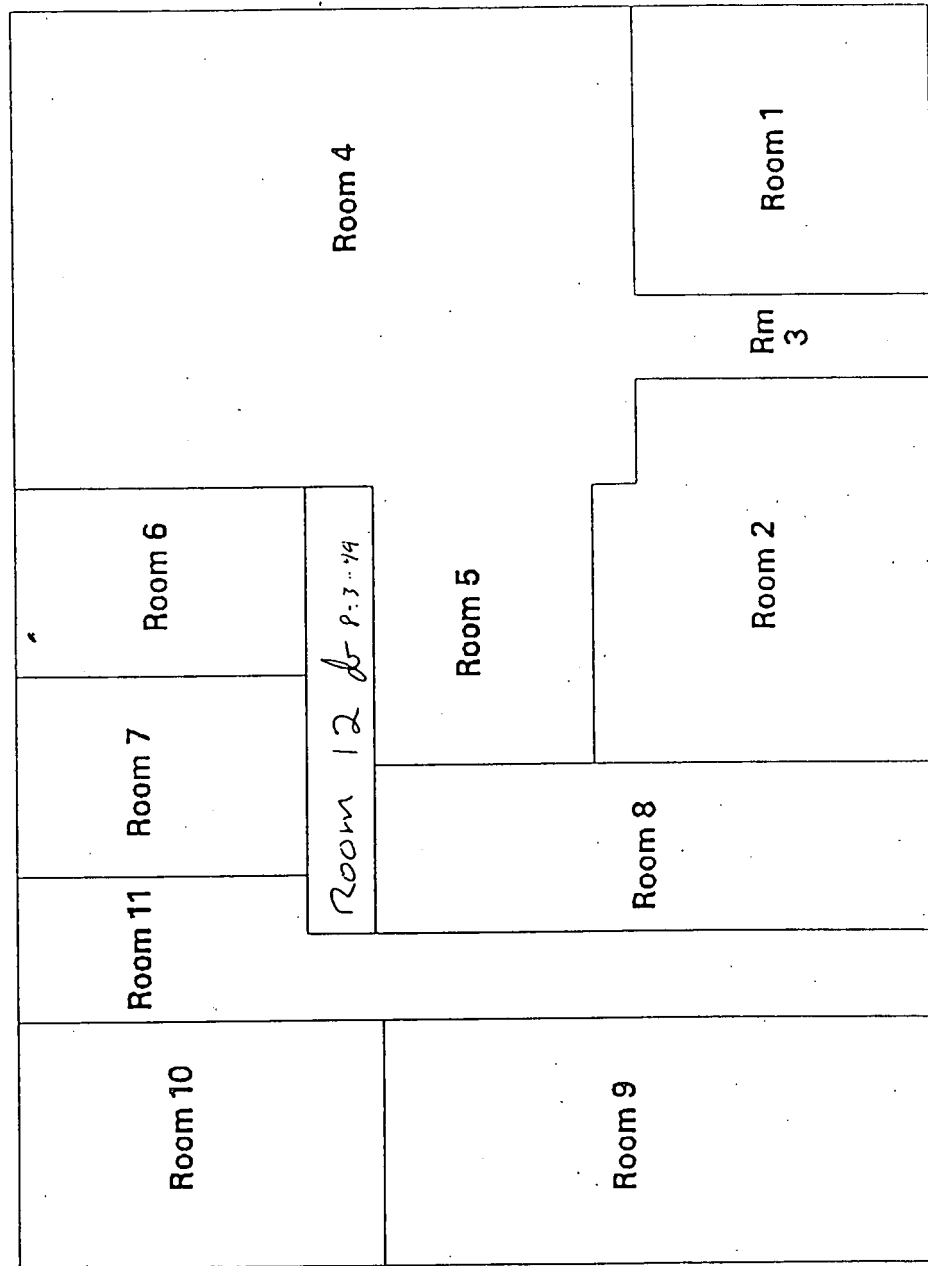
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57

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|----|----------------------------------------------------------------------------------------------|---|--------------|-------|---------------------------|---|---|---|---------|-------|---|---|---|---|---|----|----|-------|---|----|---|---------|---|---|---|---|---|----|----|----|----|----|----|----|----|
| 52 | T112A Room 10 | | | | | | | | | | | | | | | 12 | | | | 12 | | | | | | | | | | | | | | | |
| 53 | 5 | | | | | 5 | | | | | | | | | | 11 | | | | 11 | | | | | | | | | | | | | | | |
| 54 | 4 | | | Floor | | 4 | | | Ceiling | | | | | | | 10 | | | | 10 | | | | | | | | | | | | | | | |
| 55 | 3 | | QA | | | 3 | | | | | | | | | | 9 | QA | | | 9 | | | | | | | | | | | | | | | |
| 56 | 2 | | | | | 2 | | | | | | | | | | 8 | | | | 8 | | | | | | | | | | | | | | | |
| 57 | 1 | | | | | 1 | | | | | | | | | | 7 | | | | 7 | | | | | | | | | | | | | | | |
| 58 | | A | B | C | | | A | B | C | | | | | | | 6 | | | | 6 | | | | | | | | | | | | | | | |
| 59 | | | | | | | | | | Walls | | | | | | 5 | | Floor | | 5 | | Ceiling | | | | | | | | | | | | | |
| 60 | 2 | | | | | | | | | | | | | | | 4 | QA | | | 4 | | | | | | | | | | | | | | | |
| 61 | 1 | | | | | | | | | | | | | | | 3 | | | | 3 | | | | | | | | | | | | | | | |
| 62 | | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | | 2 | | | | | | | | | | | | | | | |
| 63 | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | |
| 64 | T112A Room 11 | | | | | | | | | | | | | | | | A | B | C | | | A | B | C | | | | | | | | | | | |
| 65 | 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 66 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 67 | | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | AA | AB | AC | AD | AE | AF | AG | AH |
| 68 | T112A Room 12 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 69 | 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 70 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | A | B | C | D | E | F | G | H | I | J | K | L | M | N | | A | B | C | D | E | F | | | | | | | A | B | C | D | E | F | |
| | 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | X-Coordinate | | Y-Coordinate | | Area = 820 m ² | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | Scans = 82 m ² | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | = one square meter | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | = 1.5"/sec scan | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | = direct & smear | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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6/23

Building T112A Floorplan



Survey Type CONTAMINATION SURVEY

| | |
|-----------|------------------------|
| Building: | T122A Interior |
| Location: | 280 Yard |
| Purpose: | MARSSIM Release Survey |

RWP #: N/A

Date: 08-11-99 Time: 14:30

RCT: Hersey /
 Print name Signature

RCT: Espinoza /
Print name Signature

| Mfg. | Eberline | Mfg. | Eberline | Mfg. | NEtech |
|------------|----------|------------|----------|------------|---------------|
| Model | BC-4 | Model | BC-4 | Model | Electra |
| Serial# | 700 | Serial# | 770 | Serial# | 1255 |
| Cal Due | 10/22/99 | Cal Due | 1/7/00 | Cal Due | 9/16/99 |
| Bkg. | 40 cpm | Bkg. | 38 cpm | Bkg. | 3 495 cpm |
| Efficiency | 25 % | Efficiency | 25 % | Efficiency | 21.9 30.3 % |
| MDA | 200 dpm | MDA | 200 dpm | MDA | 49 351 dpm |

Comments: All results in scans were approx. equal to background except ave. points of each grid noted on page 2

Alpha removable was a two minute count.

SURVEY RESULTS

QA #12

QA #15

Information Only

N/A

T112A interior

COVER SHEET

| | removable | | total | |
|----|-----------|------|--------|------|
| | counts | | counts | |
| | alpha | beta | alpha | beta |
| 1 | 1 | 40 | 0 | 405 |
| 2 | 0 | 47 | 1 | 304 |
| 3 | 1 | 40 | 0 | 377 |
| 4 | 0 | 40 | 3 | 376 |
| 5 | 0 | 32 | 0 | 354 |
| 6 | 1 | 32 | 0 | 352 |
| 7 | 0 | 40 | 1 | 411 |
| 8 | 0 | 41 | 4 | 322 |
| 9 | 0 | 38 | 2 | 239 |
| 10 | 0 | 33 | 1 | 282 |
| 11 | 2 | 36 | 4 | 288 |
| 12 | 1 | 40 | 2 | 393 |
| 13 | 0 | 29 | 2 | 362 |
| 14 | 0 | 47 | 2 | 367 |
| 15 | 0 | 38 | 3 | 288 |
| 16 | 0 | 41 | 2 | 286 |
| 17 | | | | |
| 18 | | | | |
| 19 | | | | |
| 20 | | | | |
| 21 | | | 1 | 384 |
| 22 | | | 0 | 396 |
| 23 | | | 5 | 293 |
| 24 | | | 1 | 397 |
| 25 | | | 2 | 276 |
| 26 | | | | |
| 27 | | | | |
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INFORMATION ONLY

RADIOLOGICAL SAFETY

Continuation Sheet

SURVEY RESULTS

INFORMATION ONLY

Date Reviewed: _____ RS Supervision: _____

| | | |
|------------|-----------|--------|
| Print Name | Signature | Emp. # |
|------------|-----------|--------|

CONTINUATION SHEET

| | REMOVABLE COUNTS | | TOTAL COUNTS | |
|----|---------------------|------|-----------------|------|
| | ALPHA | BETA | ALPHA | BETA |
| 1 | | | 20 | 650 |
| 2 | | | 20 | 650 |
| 3 | | | 20 | 650 |
| 4 | | | 20 | 650 |
| 5 | | | | |
| 6 | | | | |
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| | REMOVABLE COUNTS | | TOTAL COUNTS | |
|----|---------------------|------|-----------------|------|
| | ALPHA | BETA | ALPHA | BETA |
| 36 | | | | |
| 37 | | | | |
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INFORMATION ONLY

[illegible]

3. All counts are to be 1 minute in duration.

LN Cooper

RO SUPERVISOR PRINT NAME

RO SUPERVISOR SIGNATURE

DATE _____

NOTE If the instrument will be used for alpha measurements only, the beta portion of the test log should be lined through. If the instrument will be used for beta only, then the alpha portion should be lined through.

Best Available Copy

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

SWIPE COUNTER PERFORMANCE LOG

ALPHA ☒ BETA ☐

INSTRUMENT MODEL: (Circle One)

SAC-4 BC-41 LUDLUM 2929

Counter Serial No. 835

Calibration Due Date: 10-26-99

Start Date: 8-9-99

End Date: 8-15-99

Building: 549

Location: Bldg 266

Source: SN 680141

D. P. M.: 24830

Certification Due Date: N/A

Shift M1 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____
 (Print Name / Signature)

Shift D1 Gross Source cpm: 7403
 Time: 0630 Bkg. cpm: 0.1
 RCT Emp. # _____ Net Source cpm: 7403
 % Error: -9.6
 (Print Name / Signature)

Shift P1 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____
 (Print Name / Signature)

Shift M2 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____
 (Print Name / Signature)

Shift D2 Gross Source cpm: 7081
 Time: 0630 Bkg. cpm: 0.2
 RCT Emp. # _____ Net Source cpm: 7081
 % Error: -13.5
 (Print Name / Signature)

Shift P2 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____
 (Print Name / Signature)

Shift M3 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____
 (Print Name / Signature)

Shift D3 Gross Source cpm: 6866
 Time: 0630 Bkg. cpm: 0.2
 RCT Emp. # _____ Net Source cpm: 6866
 % Error: -16.2
 (Print Name / Signature)

Shift P3 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____
 (Print Name / Signature)

Shift M4 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____
 (Print Name / Signature)

Shift D4 Gross Source cpm: 6836
 Time: 0630 Bkg. cpm: 0.0
 RCT Emp. # _____ Net Source cpm: 6836
 % Error: -14.5
 (Print Name / Signature)

Shift P4 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____
 (Print Name / Signature)

Shift M5 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____
 (Print Name / Signature)

Shift D5 Gross Source cpm: 7053
 Time: 0630 Bkg. cpm: 0.3
 RCT Emp. # _____ Net Source cpm: 7053
 % Error: -17.9
 (Print Name / Signature)

Shift P5 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____
 (Print Name / Signature)

Shift M6 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____
 (Print Name / Signature)

Shift D6 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____
 (Print Name / Signature)

Shift P6 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____
 (Print Name / Signature)

Shift M7 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____
 (Print Name / Signature)

Shift D7 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____
 (Print Name / Signature)

Shift P7 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____
 (Print Name / Signature)

% ERROR = $\frac{(\text{Net cpm}/E) - \text{Source dpm}}{\text{Source dpm}} \times 100$

Source dpm
 Net cpm = gross - background cpm

E = Efficiency: 0.33 for the SAC-4 and 0.25 for the BC-4

Approved by

LN Cooper

L. Cooper

Emp. # 17-99

Best Available Copy

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

SWIPE COUNTER PERFORMANCE LOG

ALPHA ☒ BETA ☐

INSTRUMENT MODEL: (Circle One)

SAC-4/BC-4/LUDLUM 2929

Counter Serial No. 824

Calibration Due Date: 10-13-99

Start Date: 8-16-99

End Date: 8-22-99

Building: 549

Location: office

Source: SN 600141

D. P. M.: 24830

Certification Due Date: 10/14

Shift M1 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____

(Print Name / Signature)

Shift O1 Gross Source cpm: 7479
 Time: 0600 Bkg. cpm: 0.0
 RCT Emp. # [redacted] Net Source cpm: 7479
 % Error: -8.7

(Print Name / Signature)

Shift P1 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____

(Print Name / Signature)

Shift M2 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____

(Print Name / Signature)

Shift D2 Gross Source cpm: 7293
 Time: 0600 Bkg. cpm: 0.1
 RCT Emp. # [redacted] Net Source cpm: 7293
 % Error: -11.0

(Print Name / Signature)

Shift P2 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____

(Print Name / Signature)

Shift M3 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____

(Print Name / Signature)

Shift D3 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____

(Print Name / Signature)

Shift P3 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____

(Print Name / Signature)

Shift M4 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____

(Print Name / Signature)

Shift D4 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____

(Print Name / Signature)

Shift P4 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____

(Print Name / Signature)

Shift M5 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____

(Print Name / Signature)

Shift D5 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____

(Print Name / Signature)

Shift P5 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____

(Print Name / Signature)

Shift M6 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____

(Print Name / Signature)

Shift D6 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____

(Print Name / Signature)

Shift P6 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____

(Print Name / Signature)

Shift M7 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____

(Print Name / Signature)

Shift D7 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____

(Print Name / Signature)

Shift P7 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____

(Print Name / Signature)

% ERROR = (Net cpm/E) - Source dpm x 100

Source dpm

Net cpm = gross - background cpm

E = Efficiency = 0.33 for the SAC-4 and 0.25 for the BC-4

Approved by

LN Cooper

Signature

Emp. #

Date

8-17-99

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

SWIPE COUNTER PERFORMANCE LOG

INSTRUMENT MODEL: (Circle One)

ALPHA ☐ BETA ☒SAC-4 KBC-41 LUDLUM 2929 Counter Serial No.: 770 Calibration Due Date: 1-2-00Start Date: 8-9-99 End Date: 8-15-99 Building: 529 Location: OfficeSource: SIN 603927 D. P. M.: 22723 Certification Due Date: N/A

Shift M1 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____

(Print Name / Signature)

Shift D1 Gross Source cpm: 5382
 Time: 0630 Bkg. cpm: 37
 RCT Emp. # _____ Net Source cpm: 5345
Hasenkamp / Hasenkamp % Error: -5.9

(Print Name / Signature)

Shift P1 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____

(Print Name / Signature)

Shift M2 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____

(Print Name / Signature)

Shift D2 Gross Source cpm: 5182
 Time: 0630 Bkg. cpm: 39
 RCT Emp. # _____ Net Source cpm: 5143
Hasenkamp / Hasenkamp % Error: -9.0

(Print Name / Signature)

Shift P2 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____

(Print Name / Signature)

Shift M3 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____

(Print Name / Signature)

Shift D3 Gross Source cpm: 5217
 Time: 0630 Bkg. cpm: 38
 RCT Emp. # _____ Net Source cpm: 5239
Hasenkamp / Hasenkamp % Error: -2.1

(Print Name / Signature)

Shift P3 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____

(Print Name / Signature)

Shift M4 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____

(Print Name / Signature)

Shift D4 Gross Source cpm: 5130
 Time: 0630 Bkg. cpm: 42
 RCT Emp. # _____ Net Source cpm: 5088
Hasenkamp / Hasenkamp % Error: -10.4

(Print Name / Signature)

Shift P4 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____

(Print Name / Signature)

Shift M5 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____

(Print Name / Signature)

Shift D5 Gross Source cpm: 5159
 Time: 0630 Bkg. cpm: 39
 RCT Emp. # _____ Net Source cpm: 5120
Hasenkamp / Hasenkamp % Error: -4.8

(Print Name / Signature)

Shift P5 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____

(Print Name / Signature)

Shift M6 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____

(Print Name / Signature)

Shift D6 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____

(Print Name / Signature)

Shift P6 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____

(Print Name / Signature)

Shift M7 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____

(Print Name / Signature)

Shift D7 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____

(Print Name / Signature)

Shift P7 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____

(Print Name / Signature)

$$\% \text{ ERROR} = \frac{(\text{Net cpm} / E) - \text{Source dpm}}{\text{Source dpm}} \times 100$$

Net cpm = gross - background cpm

E = Efficiency = 0.33 for the SAC-4 and 0.25 for the BC-4

Approved by

L. Cooper

Signature

Emp. #

Date

8-17-99

| | | |
|------------------------------------------------------------------------|----------------------------|------------------------|
| Survey Area: T112 | Survey Unit: Unit A | Building: T112A |
| Survey Unit Description: Office trailer – Pre Demolition Survey | | |

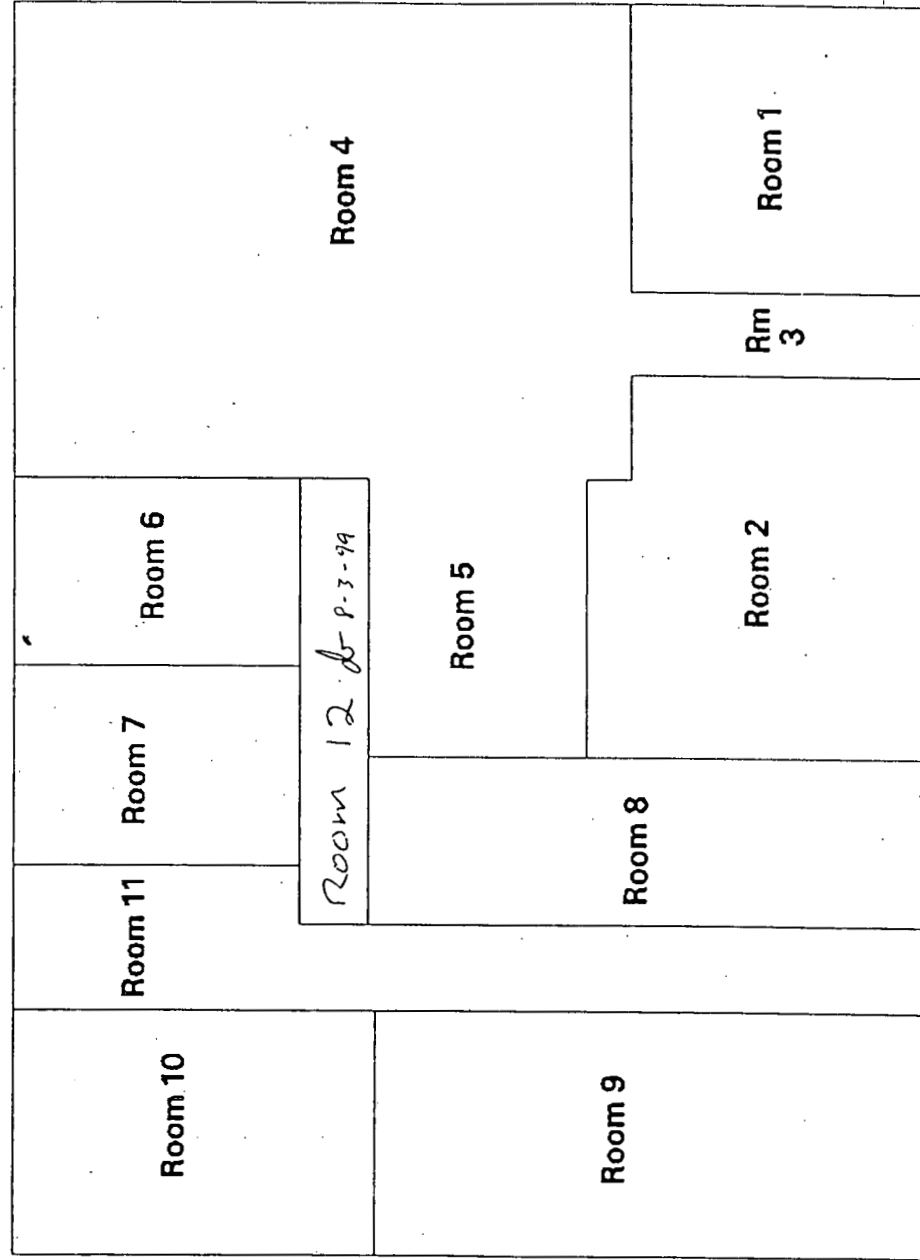
SAMPLING AND SURVEY INSTRUCTIONS

| Minimum Survey & Sample Measurement Requirements | | |
|--------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Measurement | Amount & Type | Comments |
| Surface Activity Measurements: | 16 survey points (alpha & beta, direct & removable) on trailer surfaces. 5 duplicate survey points for QA purposes. | Representative surveys of the area will be taken for total and removable, alpha and beta contamination in accordance with 3-PRO-165-RSP-07.02, "Contamination Monitoring Requirements" and IWCP The RCT will document the readings of all surveys performed. QA survey points done by different RCT Duplicate smears will be taken at a directly adjacent location. |
| Surface Scanning: | 10% scan surveys on trailer surfaces. 5% duplicate scan areas for QA purposes. | 1 m ² scan surveys will be performed at locations indicated. Scan surveys of the area will be taken for alpha and beta contamination at a scan rate of 1.5 inches per second. QA scan areas done by different RCT |
| Media Samples: | None | None |
| Volumetric Samples: | None | None |

5/23

6/23

Building T112A Floorplan



72

13

Appendix 3

Radiological Survey Data for Exterior of Trailer T112A (Survey Unit D)

APPENDIX 3 - Survey Unit D (Exterior T112A)

- Survey Unit D Data Summary
- MARSSIM Calibration/Verification Worksheet
- Total and Removable Radiological Survey Results
- Performance Test Logs
- Survey Package Cover Sheet
- Sampling and Survey Instructions
- Grid Survey Map
- Laboratory Radiochemistry Results
- Chain of Custody

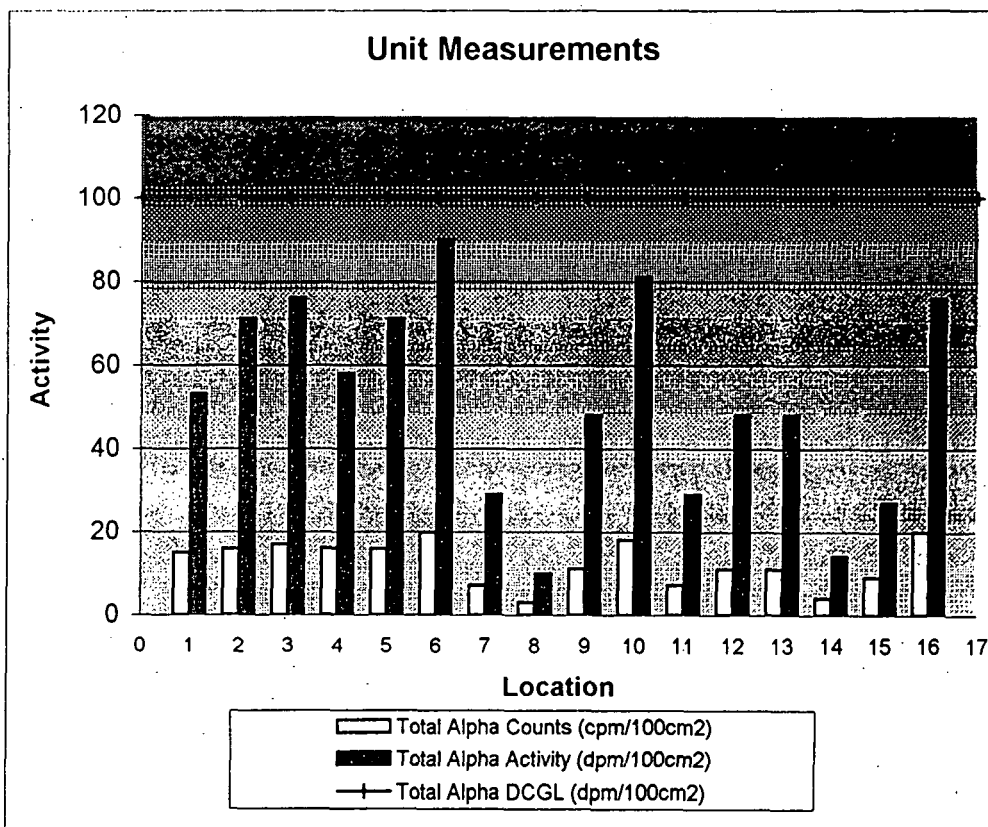
Total Alpha

Survey D Unit Data Summary - T112A Exterior

August 19, 1999

| | | | | 08/10/99 | 8/19/99 | |
|---------------------|----------|------|------|------------------------|---------|--------|
| standard deviation: | 24.67717 | max: | 90.0 | Instrument background: | 1 cpm | 3 cpm |
| mean: | 51.8125 | min: | 10.0 | Instrument efficiency: | 21.0 % | 22.5 % |
| median: | 50.5 | | | Instrument MDA: | 33 dpm | 48 dpm |

| | Surface Location | | | Grid Location | Total Alpha Counts (cpm/100cm ²) | Total Alpha Activity (dpm/100cm ²) | Total Alpha DCGL (dpm/100cm ²) |
|----|------------------|---|------|---------------|-------------------------------------------------|---------------------------------------------------|-----------------------------------------------|
| 1 | Exterior | | Roof | A2 | 15 | 53 | 100 |
| 2 | Exterior | | Roof | E3 | 16 | 71 | 100 |
| 3 | Exterior | | Roof | E5 | 17 | 76 | 100 |
| 4 | Exterior | | Roof | G3 | 16 | 58 | 100 |
| 5 | Exterior | | Roof | M8 | 16 | 71 | 100 |
| 6 | Exterior | | Roof | N7 | 20 | 90 | 100 |
| 7 | Exterior | 2 | Wall | I2 | 7 | 29 | 100 |
| 8 | Exterior | 2 | Wall | K3 | 3 | 10 | 100 |
| 9 | Exterior | 2 | Wall | O3 | 11 | 48 | 100 |
| 10 | Exterior | 2 | Wall | B1 | 18 | 81 | 100 |
| 11 | Exterior | N | Wall | A1 | 7 | 29 | 100 |
| 12 | Exterior | N | Wall | D1 | 11 | 48 | 100 |
| 13 | Exterior | N | Wall | C3 | 11 | 48 | 100 |
| 14 | Exterior | S | Wall | E3 | 4 | 14 | 100 |
| 15 | Exterior | | Roof | R5 | 9 | 27 | 100 |
| 16 | Exterior | | Roof | A6 | 20 | 76 | 100 |



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Total Beta

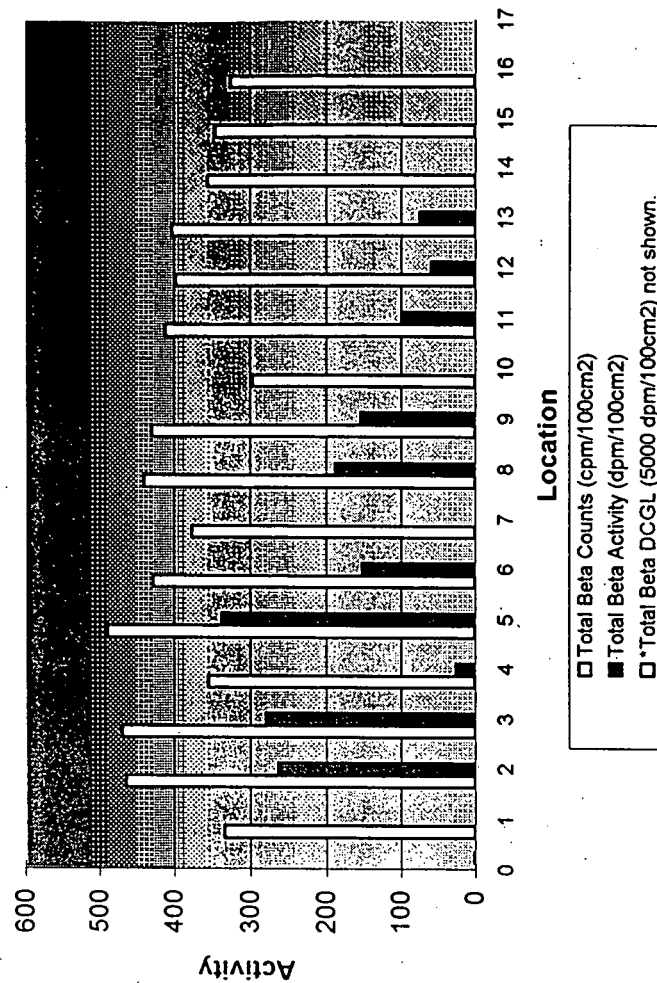
Survey D Unit Data Summary - T112A Exterior

August 19, 1999

| | | | | | |
|---------------------|---------------|----------|--------|------------------------|---------|
| | | 08/10/99 | | 8/19/99 | |
| standard deviation: | 153.1643 | max: | 336.0 | Instrument background: | 379 cpm |
| | mean: 73.3125 | min: | -256.0 | Instrument efficiency: | 30.4 % |
| | median: 66.5 | | | Instrument MDA: | 288 dpm |
| | | | | 294 dpm | |

| Surface Location | | Grid Location | Total Beta Counts (cpm/100cm ²) | Total Beta Activity (dpm/100cm ²) | Total Beta DCGL (dpm/100cm ²) | |
|------------------|----------|---------------|------------------------------------------------|--------------------------------------------------|----------------------------------------------|------|
| 1 | Exterior | Roof | A2 | 333 | -43 | 5000 |
| 2 | Exterior | Roof | E3 | 464 | 262 | 5000 |
| 3 | Exterior | Roof | E5 | 469 | 278 | 5000 |
| 4 | Exterior | Roof | G3 | 354 | 26 | 5000 |
| 5 | Exterior | Roof | M8 | 488 | 336 | 5000 |
| 6 | Exterior | Roof | N7 | 428 | 151 | 5000 |
| 7 | Exterior | 2 Wall | I2 | 375 | -12 | 5000 |
| 8 | Exterior | 2 Wall | K3 | 440 | 188 | 5000 |
| 9 | Exterior | 2 Wall | O3 | 429 | 154 | 5000 |
| 10 | Exterior | 2 Wall | B1 | 296 | -256 | 5000 |
| 11 | Exterior | N Wall | A1 | 411 | 99 | 5000 |
| 12 | Exterior | N Wall | D1 | 398 | 59 | 5000 |
| 13 | Exterior | N Wall | C3 | 403 | 74 | 5000 |
| 14 | Exterior | S Wall | E3 | 355 | -74 | 5000 |
| 15 | Exterior | Roof | R5 | 346 | 0 | 5000 |
| 16 | Exterior | Roof | A6 | 325 | -69 | 5000 |

Unit Measurements



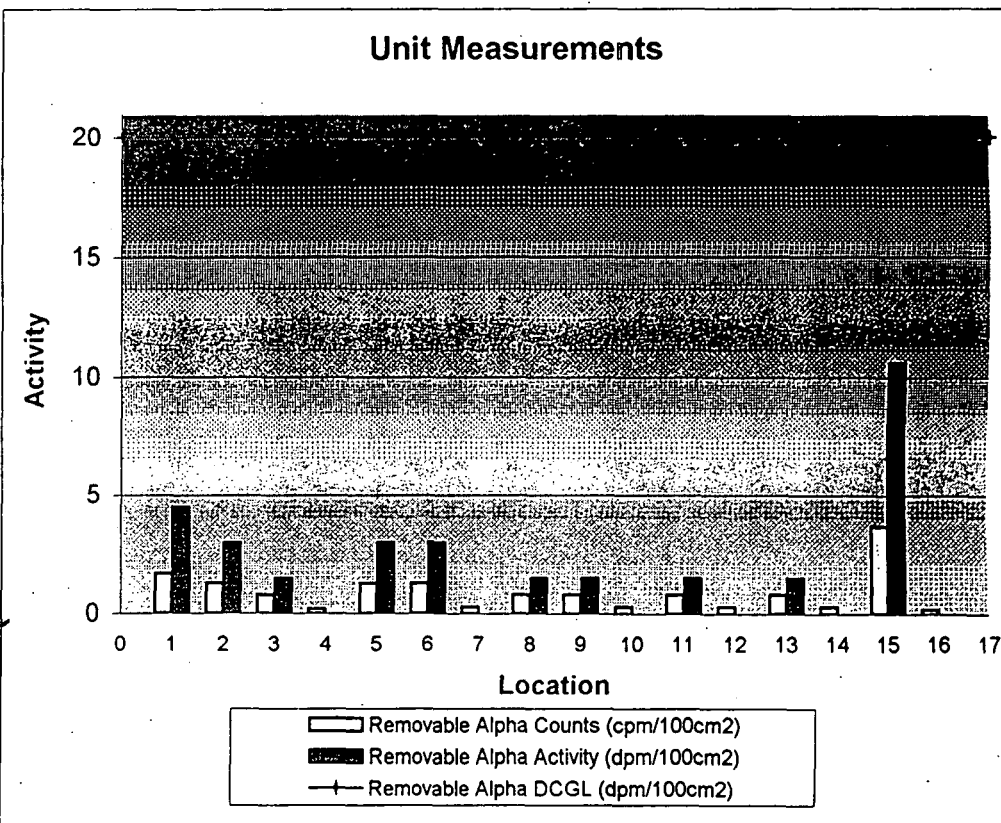
Removable Alpha

Survey D Unit Data Summary - T112A Exterior

August 19, 1999

| | | | | 08/10/99 | 8/19/99 | |
|---------------------|----------|------|------|------------------------|---------|---------|
| standard deviation: | 2.688866 | max: | 10.6 | Instrument background: | 0.3 cpm | 0.2 cpm |
| mean: | 1.975 | min: | 0.0 | Instrument efficiency: | 33 % | 33 % |
| median: | 1.5 | | | Instrument MDA: | 8.3 dpm | 7.5 dpm |

| | Surface Location | | Grid Location | Removable Alpha Counts (cpm/100cm ²) | Removable Alpha Activity (dpm/100cm ²) | Removable Alpha DCGL (dpm/100cm ²) |
|----|------------------|--------|---------------|-----------------------------------------------------|-------------------------------------------------------|---------------------------------------------------|
| 1 | Exterior | Roof | A2 | 2 | 4.5 | 20 |
| 2 | Exterior | Roof | E3 | 1 | 3 | 20 |
| 3 | Exterior | Roof | E5 | 1 | 1.5 | 20 |
| 4 | Exterior | Roof | G3 | 0 | 0 | 20 |
| 5 | Exterior | Roof | M8 | 1 | 3 | 20 |
| 6 | Exterior | Roof | N7 | 1 | 3 | 20 |
| 7 | Exterior | 2 Wall | I2 | 0 | 0 | 20 |
| 8 | Exterior | 2 Wall | K3 | 1 | 1.5 | 20 |
| 9 | Exterior | 2 Wall | O3 | 1 | 1.5 | 20 |
| 10 | Exterior | 2 Wall | B1 | 0 | 0 | 20 |
| 11 | Exterior | N Wall | A1 | 1 | 1.5 | 20 |
| 12 | Exterior | N Wall | D1 | 0 | 0 | 20 |
| 13 | Exterior | N Wall | C3 | 1 | 1.5 | 20 |
| 14 | Exterior | S Wall | E3 | 0 | 0 | 20 |
| 15 | Exterior | Roof | R5 | 4 | 10.6 | 20 |
| 16 | Exterior | Roof | A6 | 0 | 0 | 20 |



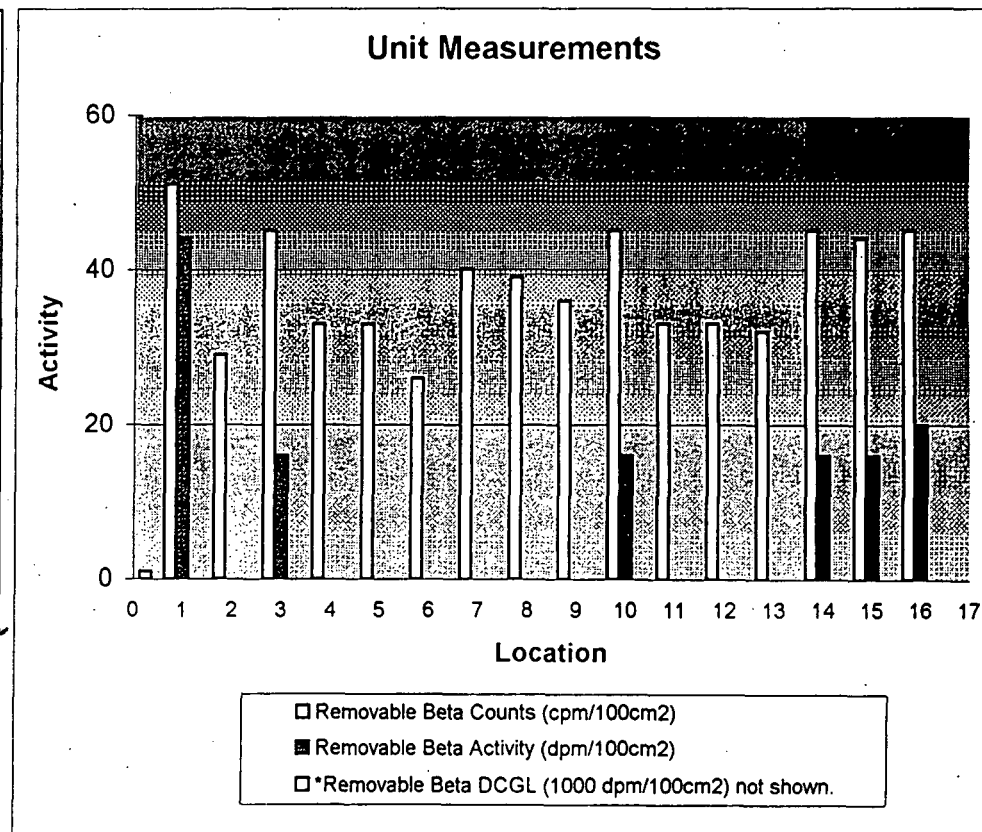
Removable Beta

Survey D Unit Data Summary - T112A Exterior

August 19, 1999

| | | | | | | |
|---------------------|----------|------|----------|------------------------|---------|---------|
| | | | 08/10/99 | 8/19/99 | | |
| standard deviation: | 29.49237 | max: | 44.0 | Instrument background: | 41 cpm | 40 cpm |
| mean: | -10.75 | min: | -60.0 | Instrument efficiency: | 25 % | 25 % |
| median: | -14 | | | Instrument MDA: | 200 dpm | 200 dpm |

| | Surface Location | | | Grid Location | Removable Beta Counts (cpm/100cm ²) | Removable Beta Activity (dpm/100cm ²) | Removable Beta DCGL (dpm/100cm ²) |
|----|------------------|---|------|---------------|----------------------------------------------------|------------------------------------------------------|--------------------------------------------------|
| 1 | Exterior | | Roof | A2 | 51 | 44 | 1000 |
| 2 | Exterior | | Roof | E3 | 29 | -48 | 1000 |
| 3 | Exterior | | Roof | E5 | 45 | 16 | 1000 |
| 4 | Exterior | | Roof | G3 | 33 | -28 | 1000 |
| 5 | Exterior | | Roof | M8 | 33 | -32 | 1000 |
| 6 | Exterior | | Roof | N7 | 26 | -60 | 1000 |
| 7 | Exterior | 2 | Wall | I2 | 40 | -4 | 1000 |
| 8 | Exterior | 2 | Wall | K3 | 39 | -8 | 1000 |
| 9 | Exterior | 2 | Wall | O3 | 36 | -20 | 1000 |
| 10 | Exterior | 2 | Wall | B1 | 45 | 16 | 1000 |
| 11 | Exterior | N | Wall | A1 | 33 | -32 | 1000 |
| 12 | Exterior | N | Wall | D1 | 33 | -32 | 1000 |
| 13 | Exterior | N | Wall | C3 | 32 | -36 | 1000 |
| 14 | Exterior | S | Wall | E3 | 45 | 16 | 1000 |
| 15 | Exterior | | Roof | R5 | 44 | 16 | 1000 |
| 16 | Exterior | | Roof | A6 | 45 | 20 | 1000 |



| | |
|----------------------------------------|------------------------|
| Survey Area: T112 | Building: T112A |
| Survey Unit: D (T112A Exterior) | |

Post Survey Removable Contamination Summary Statistics Calculation Verification Worksheet

Step 1:

Conduct a preliminary data review: (the mean, standard deviation, and median of the Unit D removable surface contamination data are calculated on the "Survey Unit D Data" sheet. Because all removable survey measurement results are less than DCGL_w (alpha less than 20 dpm/100 cm², beta less than 1000 dpm/100 cm²), the survey unit clearly meets the removable contamination release criterion.

Step 2:

Select the statistical tests: The one-sample sign test was selected to assess the data, with $\alpha = 0.05$ and $\beta = 0.05$. The number of sample points calculated was based on the use of this test.

The performance of the sign test was not necessary due to the fact that each individual net result was less than the DCGL_w. Thus, the sign test would result in the rejection of the null hypothesis, and conclude that the median concentration of residual radioactivity in the survey unit is less than the DCGL_w.

Step 3:

Verify the assumptions of the test: The assumed data variance, as indicated by the assumed standard deviation was verified by re-calculating the required number of smears with the ACTUAL survey unit standard deviation.

The actual removable survey standard deviations for Unit D are: α 2.69 β 26.7

Thus, the ACTUAL required number of measurements is as follows:

α :

$$\Delta/\delta = (\text{DCGL}_{\text{REMOVABLE}} - \text{LBGR}_{\text{REMOVABLE}}) / \text{SD}_{\text{REMOVABLE}}$$

$$\Delta/\delta_{\text{transuranics}} = (20 \text{ dpm}/100\text{cm}^2 - 10 \text{ dpm}/100\text{cm}^2) / 2.69 \text{ dpm}/100\text{cm}^2 = 3.7$$

β :

$$\Delta/\delta = (\text{DCGL}_{\text{REMOVABLE}} - \text{LBGR}_{\text{REMOVABLE}}) / \text{SD}_{\text{REMOVABLE}}$$

$$\Delta/\delta_{\text{transuranics}} = (1000 \text{ dpm}/100\text{cm}^2 - 500 \text{ dpm}/100\text{cm}^2) / 26.7 \text{ dpm}/100\text{cm}^2 = 18.7$$

Where:

Δ/δ is the relative shift or the resolution of measurements in units of measurement uncertainty.

DCGL_{REMOVABLE} is the removable surface contamination derived concentration guideline value (DOE Order 5400.5 removable surface contamination limit equals 20 dpm/100cm² for transuranics per the T112A-C Pre Demolition Survey Plan)

LBGR_{REMOVABLE} is the lower bound of the gray region – the lower bound of the range of values of the parameter of interest in a survey unit where the consequences of making a decision error is relatively minor (set equal to value utilized in original sample size calculation).

SD_{REMOVABLE} is the ACTUAL standard deviation of the removable surface contamination measurements

Determine the Sign P value by looking up the relative shift (Δ/δ) in Table 5.4 of MARSSIM (the Sign P value is the estimated probability that a random measurement from the survey unit will be less than the DCGL when the survey unit median is actually at the LBGR). The Sign P value from Table 5.4, equals 0.998650 for a relative shift of 3.0 (The highest published value is utilized for conservatism).

Survey Area: T112**Building:** T112A**Survey Unit:** D (T112A Exterior)**Post Survey Removable Contamination Summary Statistics Calculation Verification Worksheet****Step 3: Continued**

Determine the number of removable surface contamination measurements for the applicable survey unit using the following MARSSIM, Section 5.5.2.3 formula that is based on radioactive contaminants of concern not being present in the background:

 α

$$N = (1.645 + 1.645)^2 / 4(\text{Sign } P - 0.5)^2$$

$$N = (1.645 + 1.645)^2 / 4(0.998650 - 0.5)^2 = 10.9$$

 β

$$N = (1.645 + 1.645)^2 / 4(\text{Sign } P - 0.5)^2$$

$$N = (1.645 + 1.645)^2 / 4(0.998650 - 0.5)^2 = 10.9$$

Where:

1.645 is the alpha and beta decision error value (95% confidence) per the T112A-C Pre Demolition Survey Plan

Sign P equals 0.998650

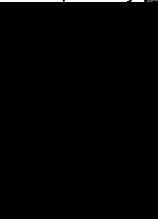
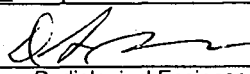
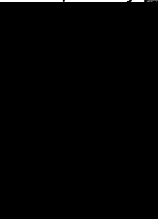
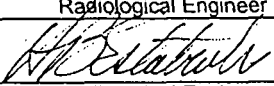
Step 4: Increase N by 20% to allow for missing or invalid data points per MARSSIM, Section 5.5.2.3.

$$N = 10.9 * 1.2 = 13$$

Conclusion: Utilizing a conservative relative shift value of 3.0, a minimum of 13 α and β Removable Surface Contamination measurements were required in Unit D.

Step 4:

Draw conclusions from the data: All measurements are less than DCGL_w. The minimum number of required removable survey measurements were collected. Thus, survey Unit D complies with the removable contamination release criteria.

| | | | |
|---------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------|
| D. A. BARNES |  |  | 8-19-99 |
| Prepared By: Printed Name | | Radiological Engineer Signature | Date |
| H. B. ESTABROOKS |  |  | 8/19/99 |
| Reviewed By: Printed Name | | Radiological Engineer Signature | Date |

Survey Area: T112**Building:** T112A**Survey Unit:** D (T112A Exterior)

Post Survey Total Surface Activity Summary Statistics Calculation Verification Worksheet

Step 1:

Conduct a preliminary data review: (the mean, standard deviation, and median of the Unit D data are calculated on the "Survey Unit D Data" sheet. Because all total surface activity (TSA or TSC) measurement results are less than DCGL_w (less than 100 dpm/100 cm²), the survey unit clearly meets the TSA release criterion.

A graphical data review was also performed on the attached form. The posting plot indicated that spatial trends of elevated areas are not present. The histogram indicated that no isolated areas of elevated activity are present.

Step 2:

Select the statistical tests: The one-sample sign test was selected to assess the data, with $\alpha = 0.05$ and $\beta = 0.05$. The number of sample points calculated (see "Total Surface Activity Measurement Calculation Worksheet") was based on the use of this test. A local area background (LAB) value was subtracted from each gross measurement to calculate a net result, thus the sign test applies (sign test is typically applied only when the contaminant is not present in background).

The performance of the sign test was not necessary due to the fact that each individual net result was less than the DCGL_w. Thus, the sign test would result in the rejection of the null hypothesis, and conclude that the median concentration of residual radioactivity in the survey unit is less than the DCGL_w.

Step 3:

Verify the assumptions of the test: The assumed data variance, as indicated by the assumed standard deviation was verified by re-calculating the required number of samples with the ACTUAL survey unit standard deviation.

The actual total surface contamination standard deviations for Unit D are: α 24.7 β 153

Thus, the ACTUAL required number of samples is as follows:

$$\Delta/\delta = (\text{DCGL}_{\text{TSA}} - \text{LBGR}_{\text{TSA}}) / \text{SD}_{\text{TSA}}$$

$$\alpha$$

$$\Delta/\delta_{\text{transuranics}} = (100 \text{ dpm}/100\text{cm}^2 - 50 \text{ dpm}/100\text{cm}^2) / 24.7 \text{ dpm}/100\text{cm}^2 = 2.0$$

$$\beta$$

$$\Delta/\delta_{\text{transuranics}} = (5000 \text{ dpm}/100\text{cm}^2 - 2500 \text{ dpm}/100\text{cm}^2) / 153 \text{ dpm}/100\text{cm}^2 = 16.4$$

Where:

Δ/δ is the relative shift or the resolution of measurements in units of measurement uncertainty

DCGL_{TSA} is the total surface Activity derived concentration guideline value (DOE Order 5400.5 total surface Activity limit equals 100 dpm/100cm² for transuranics and 5000 dpm/100cm² for uranium, per the T112A-C Pre Demolition Survey Plan)

LBGR_{TSA} is the lower bound of the gray region – the lower bound of the range of values of the parameter of interest in a survey unit where the consequences of making a decision error is relatively minor (set equal to the value utilized in the original sample size calculation).

SD_{TSA} is the ACTUAL standard deviation of the total surface Activity

Determine the Sign P value by looking up the relative shift (Δ/δ) in Table 5.4 of MARSSIM (the Sign P value is the estimated probability that a random measurement from the survey unit will be less than the DCGL when the survey unit median is actually at the LBGR). The Sign P value from Table 5.4, equals 0.998650 for a relative shift of 3.0 (The highest published value is utilized for conservatism).

| | |
|----------------------------------------|------------------------|
| Survey Area: T112 | Building: T112A |
| Survey Unit: D (T112A Exterior) | |

Post Survey Total Surface Activity Summary Statistics Calculation Verification Worksheet

Step 3: Continued

Determine the number of TSA surface Activity measurements for the applicable survey unit using the following MARSSIM, Section 5.5.2.3 formula that is based on Plutonium contaminants not being present in the background:

α and β

$$N = (1.645 + 1.645)^2 / 4(\text{Sign } P - 0.5)^2$$

$$N = (1.645 + 1.645)^2 / 4(0.998650 - 0.5)^2 = \underline{10.9}$$

Where:

1.646 is the alpha and beta decision error value (95% confidence) per the T112A-C Pre Demolition Survey Plan

Sign P equals 0.998650


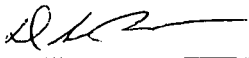
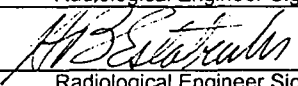
Step 4: Increase N by 20% to allow for missing or invalid data points per MARSSIM, Section 5.5.2.3.

$$N = \underline{10.9} * 1.2 = \underline{13}$$

Conclusion: Utilizing a conservative relative shift value of 3.0, a minimum of 13 Total Surface Activity measurements were required in Unit D.

Step 4:

Draw conclusions from the data: All measurements are less than DCGL_w. The minimum number of required TSA measurements were collected. Thus, survey Unit D complies with the TSA release criteria.

| | | | |
|---------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------|
| D. A. BARNES |  |  | 8-19-99 |
| Prepared By: Printed Name | | Radiological Engineer Signature | Date |
| E. M. BROOKS | |  | 8/19/99 |
| Reviewed By: Printed Name | | Radiological Engineer Signature | Date |

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

INSTRUMENT DATA

| | | |
|------------------|------------------|---------------------------|
| Mfg. Eberline | Mfg. Eberline | Mfg. N/A |
| Model SAC-4 | Model SAC-4 | Model N/A |
| Serial# 835 | Serial# 824 | Serial# N/A |
| Cal Due 10/26/99 | Cal Due 10/13/99 | Cal Due N/A |
| Bkg. 0.1 cpm | Bkg. 0.0 cpm | Bkg. N/A |
| Efficiency 33 % | Efficiency 33 % | Efficiency N/A |
| MDA 6.5 dpm | MDA 6.5 dpm | MDA N/A |

| | | |
|------------------|-----------------|-----------------------------|
| Mfg. Eberline | Mfg. Eberline | Mfg. N/A |
| Model BC-4 | Model BC-4 | Model N/A |
| Serial# 700 | Serial# 770 | Serial# N/A |
| Cal Due 10/22/99 | Cal Due 1/7/00 | Cal Due N/A |
| Bkg. 41 cpm | Bkg. 38 cpm | Bkg. N/A cpm |
| Efficiency 25 % | Efficiency 25 % | Efficiency N/A % |
| MDA 200 dpm | MDA 200 dpm | MDA N/A dpm |

Survey Type QA SWIPE SURVEYBuilding: T112 A, B & CLocation: 280 YardPurpose: MARSSIM Release SurveyRWP #: N/ADate: 08-16-99Time: 14:00RCT: Hersey

Print name

Signature

RCT: Espinoza

Print name

Signature

PRL #:

Comments: See individual maps of trailers for survey points

Alpha removable was a two minute count.

SURVEY RESULTS

| vipe # | Location/Description (Results in DPM/100CM ²) | Removable | | Total | | Swipe # | Location/Description (Results in DPM/100CM ²) | Removable | | Total | |
|--------|--------------------------------------------------------------|-----------|------|-------|------|---------|--------------------------------------------------------------|-----------|------|-------|------|
| | | Alpha | Beta | Alpha | Beta | | | Alpha | Beta | Alpha | Beta |
| 1 | T112A ROOM 4 WALL A6* | <6.5 | <200 | | | 21 | | | | | |
| 2 | T112A ROOM 6 FLOOR A1* | <6.5 | <200 | | | 22 | | | | | |
| 3 | T112A ROOM 8 WALL P2* | <6.5 | <200 | | | 23 | | | | | |
| 4 | T112A ROOM 9 FLOOR A3* | <6.5 | <200 | | | 24 | | | | | |
| 5 | T112A ROOM 11 WALL K1* | <6.5 | <200 | | | 25 | | | | | |
| 6 | T112A EXTERIOR WEST WALL B1* | <6.5 | <200 | | | 26 | | | | | |
| 7 | T112A EXTERIOR NORTH WALL A1* | <6.5 | <200 | | | 27 | | | | | |
| 8 | T112A EXTERIOR EAST WALL K3* | <6.5 | <200 | | | 28 | | | | | |
| 9 | T112A EXTERIOR SOUTH WALL E3* | <6.5 | <200 | | | 29 | | | | | |
| 10 | T112A EXTERIOR ROOF A2* | <6.5 | <200 | | | 30 | N/A | | | | |
| 11 | T112B ROOM 1 CEILING B3* | <6.5 | <200 | N/A | | 31 | | | | | |
| 12 | T112B ROOM 2 FLOOR H1* | <6.5 | <200 | | | 32 | | | | | |
| 13 | T112B EXTERIOR SOUTH WALL E2* | <6.5 | <200 | | | 33 | | | | | |
| 14 | T112B EXTERIOR NORTH WALL L1* | <6.5 | <200 | | | 34 | | | | | |
| 15 | T112B EXTERIOR ROOF F1* | <6.5 | <200 | | | 35 | | | | | |
| 16 | T112C ROOM 1 FLOOR C1* | <6.5 | <200 | | | 36 | | | | | |
| 17 | T112C ROOM 3 WALL J2* | <6.5 | <200 | | | 37 | | | | | |
| 18 | T112C ROOM 5 WALL H1* | <6.5 | <200 | | | 38 | | | | | |
| 19 | T112C ROOM 6 FLOOR C1* | <6.5 | <200 | | | 39 | | | | | |
| 20 | T112C EXTERIOR ROOF M3* | <6.5 | <200 | | | 40 | | | | | |

ate Reviewed: 8/17/99 RS Supervision: S Engelhard

Print Name

Signature

| Mfg. | Eberline | Mfg. | Eberline | Mfg. | |
|------------|----------|------------|----------|------------|-----|
| Model | SAC-4 | Model | SAC-4 | Model | |
| Serial# | 835 | Serial# | 824 | Serial# | |
| Cal Due | 10/26/99 | Cal Due | 10/13/99 | Cal Due | N/A |
| Bkg. | 0.2 cpm | Bkg. | 0.3 cpm | Bkg. | |
| Efficiency | 33 % | Efficiency | 33 % | Efficiency | |
| MDA | 7.6 dpm | MDA | 8.3 dpm | MDA | |

RCT: Espinoza / Espinoza
Print name Signature

COVER SHEET

| | removable | | total | |
|----|-----------|------|--------|------|
| | counts | | counts | |
| | alpha | beta | alpha | beta |
| 1 | 2 | 33 | 39 | 485 |
| 2 | 2 | 29 | 16 | 464 |
| 3 | 1 | 45 | 17 | 469 |
| 4 | 1 | 41 | 26 | 475 |
| 5 | 2 | 33 | 16 | 488 |
| 6 | 2 | 26 | 20 | 428 |
| 7 | 0 | 40 | 7 | 375 |
| 8 | 1 | 39 | 3 | 440 |
| 9 | 1 | 36 | 11 | 429 |
| 10 | 0 | 45 | 18 | 296 |
| 11 | 1 | 33 | 7 | 411 |
| 12 | 0 | 33 | 11 | 398 |
| 13 | 1 | 32 | 11 | 403 |
| 14 | 0 | 45 | 4 | 355 |
| 15 | | | | |
| 16 | | | | |
| 17 | | | | |
| 18 | | | | |
| 19 | | | | |
| 20 | | | | |
| 21 | | | 36 | 476 |
| 22 | | | 7 | 436 |
| 23 | | | 18 | 298 |
| 24 | | | 8 | 398 |
| 25 | | | 7 | 418 |
| 26 | | | | |
| 27 | | | | |
| 28 | | | | |
| 29 | | | | |
| 30 | | | | |
| 31 | | | | |
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ATMOSPHERIC ONLY

h
PAT'S

RADIOLOGICAL SAFETY

7100

Continuation Sheet

SURVEY RESULTS

~~N/A~~


Date Reviewed:

8/13/94

RS Supervision:

S. E. (hand)
Print Name

Print Name _____


Signature

Signature _____

Emp. #

CPM

CONTINUATION SHEET

| | REMOVABLE COUNTS | | TOTAL COUNTS | |
|----|---------------------|------|-----------------|------|
| | ALPHA | BETA | ALPHA | BETA |
| 1 | | | 15 | 296 |
| 2 | | | 15 | 331 |
| 3 | | | 15 | 603 |
| 4 | | | 7 | 411 |
| 5 | | | 7 | 392 |
| 6 | | | 15 | 439 |
| 7 | | | 7 | 320 |
| 8 | | | 11 | 401 |
| 9 | | | 15 | 305 |
| 10 | | | 11 | 326 |
| 11 | | | 7 | 296 |
| 12 | | | 15 | 412 |
| 13 | | | 10 | 448 |
| 14 | | | 12 | 396 |
| 12 | | | 7 | 440 |
| 15 | | | 18 | 421 |
| 16 | | | 15 | 350 |
| 17 | | | 12 | 507 |
| 18 | | | 61 | 296 |
| 19 | | | 11 | 412 |
| 20 | | | 7 | 602 |
| 21 | | | 11 | 313 |
| 22 | | | 15 | 405 |
| 23 | | | 21 | 505 |
| 24 | | | 17 | 455 |
| 25 | | | 14 | 465 |
| 26 | | | 15 | 457 |
| 27 | | | 20 | 442 |
| 28 | | | 18 | 468 |
| 29 | | | | |
| 30 | | | | |
| 31 | | | | |
| 32 | | | | |
| 33 | | | | |
| 34 | | | | |
| 35 | | | | |

| | REMOVABLE COUNTS | | TOTAL COUNTS | |
|----|---------------------|------|-----------------|------|
| | ALPHA | BETA | ALPHA | BETA |
| 36 | | | 4 | 432 |
| 37 | | | 18 | 298 |
| 38 | | | 7 | 418 |
| 39 | | | | |
| 40 | | | | |
| 41 | | | | |
| 42 | | | | |
| 43 | | | | |
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| 71 | | | | |

INFORMATION ONLY

INSTRUMENT DATA

| Mfg. | Eberline | Mfg. | Eberline | Mfg. | NEtech |
|------------|----------|------------|----------|------------|---------------|
| Model | BC-4 | Model | BC-4 | Model | Electra |
| Serial# | 700 | Serial# | 770 | Serial# | 1665 |
| Cal Due | 10/22/99 | Cal Due | 1/7/00 | Cal Due | 9/19/99 |
| Bkg. | 40 cpm | Bkg. | 37 cpm | Bkg. | 3 346 cpm |
| Efficiency | 25 % | Efficiency | 25 % | Efficiency | 22.5 30.4 % |
| MDA | 200 dpm | MDA | 200 dpm | MDA | 48 294 dpm |

| | | | |
|------|------------|--------------------|--------|
| RCT: | Hersey | <i>[Signature]</i> | |
| | Print name | Signature | Emp. # |
| RCT: | N/A | <i>[Signature]</i> | |
| | Print name | Signature | Emp. # |

Comments:

Alpha removable was a two minute count.

SURVEY RESULTS

[illegible]

RS Supervision:

Print Name _____

Signature _____

COVER SHEET

| | removable | | total | |
|----|-----------|------|--------|------|
| | counts | | counts | |
| | alpha | beta | alpha | beta |
| 1 | 6 | 34 | 24 | 346 |
| 2 | 2 | 29 | 37 | 389 |
| 3 | 0 | 33 | 16 | 354 |
| 4 | 7 | 44 | 9 | 346 |
| 5 | 3 | 29 | 15 | 333 |
| 6 | 0 | 45 | 20 | 325 |
| 7 | | | | |
| 8 | | | | |
| 9 | | | | |
| 10 | | | | |
| 11 | | | | |
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| 15 | | | | |
| 16 | | | | |
| 17 | | | | |
| 18 | | | | |
| 19 | | | | |
| 20 | | | | |
| 21 | | | 19 | 352 |
| 22 | | | 32 | 382 |
| 23 | | | 13 | 342 |
| 24 | | | 17 | 375 |
| 25 | | | | |
| 26 | | | | |
| 27 | | | | |
| 28 | | | | |
| 29 | | | | |
| 30 | | | | |
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ALPHA REMOVABLE
VALUES FOR
2 MIN COUNTS

GA
dh
8-24-99

INFORMATION ONLY

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

INSTRUMENT DATA

| | | |
|------------------|------------------|-----------------------------------|
| Mfg. Eberline | Mfg. Eberline | Mfg. NEtech |
| Model SAC-4 | Model SAC-4 | Model Electra |
| Serial# 835 | Serial# 824 | Serial# 1827 |
| Cal Due 10/26/99 | Cal Due 10/13/99 | Cal Due N/A |
| Bkg. 0.1 cpm | Bkg. 0.1 cpm | Bkg. 0 398 cpm |
| Efficiency 33 % | Efficiency 33 % | Efficiency 22.3 33.5 % |
| MDA 6.5 dpm | MDA 6.5 dpm | MDA 33 285 dpm |

| | | |
|------------------|------------------|------------------------|
| Mfg. Eberline | Mfg. Eberline | Mfg. NEtech |
| Model BC-4 | Model BC-4 | Model Electra |
| Serial# 905 | Serial# 702 | Serial# 1827 |
| Cal Due 09/30/99 | Cal Due 11/20/99 | Cal Due 10/27/99 |
| Bkg. 41 cpm | Bkg. 41 cpm | Bkg. 0 398 cpm |
| Efficiency 25 % | Efficiency 25 % | Efficiency 22.3 33.5 % |
| MDA 200 dpm | MDA 200 dpm | MDA 33 285 dpm |

Survey Type CONTAMINATION SURVEYBuilding: T112cLocation: 280 YardPurpose: MARSSIM Release SurveyRWP #: N/ADate: 08-05-99Time: 14:30

RCT: Hersey / [Signature] / [Emp. #]
 Print name Signature Emp. #

RCT: Espinoza / [Signature] / [Emp. #]
 Print name Signature Emp. #

PRL #: _____

Comments: All results in scans were approx. equal to background except hi points of each grid noted on page 2

Alpha removable was a two minute count.

SURVEY RESULTS

| Swipe # | Location/Description (Results in DPM/100CM ²) | Removable | | Total | | Swipe # | Location/Description (Results in DPM/100CM ²) | Removable | | Total | |
|---------|--------------------------------------------------------------|-----------|------|-------|------|---------|--------------------------------------------------------------|-----------|------|-------|------|
| | | Alpha | Beta | Alpha | Beta | | | Alpha | Beta | Alpha | Beta |
| 1 | T112C ROOM 1 FLOOR B4 | 0.0 | 36 | 45 | 257 | QA #2 | | | | 9 | 239 |
| 2 | T112C ROOM 1 FLOOR C2 * | 0.0 | 8 | 27 | 281 | QA #7 | | | | 31 | -245 |
| 3 | T112C ROOM 1 WALL D1 | 1.5 | -20 | 9 | -6 | QA #11 | | N/A | | 9 | -215 |
| 4 | T112C ROOM 1 WALL E2 | 1.5 | -20 | 22 | 72 | QA #13 | | | | 9 | -9 |
| 5 | T112C ROOM 2 WALL K2 | 0.0 | -16 | 31 | -230 | QA #16 | | | | 108 | 75 |
| 6 | T112C ROOM 3 WALL E1 | 0.0 | 4 | 18 | -137 | | | | | | |
| 7 | T112C ROOM 3 WALL J2 * | 1.5 | -8 | 9 | -334 | | | | | | |
| 8 | T112C ROOM 3 WALL L1 | 0.0 | 40 | 4 | 149 | | | | | | |
| 9 | T112C ROOM 4 WALL E2 | 0.0 | 4 | 31 | -361 | | | | | | |
| 10 | T112C ROOM 5 WALL B2 | 0.0 | 8 | 36 | -224 | | | | | | |
| 11 | T112C ROOM 5 WALL H1 * | 1.5 | -40 | 36 | -364 | | | | | | |
| 12 | T112C ROOM 5 WALL I1 | 1.5 | -24 | 9 | -346 | | | | | | |
| 13 | T112C ROOM 7 FLOOR C1 * | 0.0 | -16 | 13 | 51 | | | | | | |
| 14 | T112C EXTERIOR NORTH WALL J3 | 4.5 | -24 | 72 | -122 | | | | | | |
| 15 | T112C EXTERIOR SOUTH WALL G1 | 1.5 | -32 | 94 | -12 | | | | | | |
| 16 | T112C EXTERIOR ROOF M3 * | 0.0 | -40 | 130 | 113 | | | | | | |
| | N/A | | | | | | | | | | |

Date Reviewed: _____ RS Supervision: _____
 Print Name Signature Emp. #

COVER SHEET

| | removable | | total | |
|----|-----------|------|--------|------|
| | counts | | counts | |
| | alpha | beta | alpha | beta |
| 1 | 0 | 50 | 10 | 484 |
| 2 | 0 | 43 | 6 | 492 |
| 3 | 1 | 36 | 2 | 396 |
| 4 | 1 | 36 | 5 | 422 |
| 5 | 0 | 37 | 7 | 321 |
| 6 | 0 | 42 | 4 | 352 |
| 7 | 1 | 39 | 2 | 286 |
| 8 | 0 | 51 | 1 | 448 |
| 9 | 0 | 42 | 7 | 277 |
| 10 | 0 | 43 | 8 | 323 |
| 11 | 1 | 31 | 8 | 276 |
| 12 | 1 | 35 | 2 | 282 |
| 13 | 0 | 37 | 3 | 415 |
| 14 | 3 | 35 | 16 | 357 |
| 15 | 1 | 33 | 21 | 394 |
| 16 | 0 | 31 | 29 | 436 |
| 17 | | | | |
| 18 | | | | |
| 19 | | | | |
| 20 | | | | |
| 21 | | | 2 | 478 |
| 22 | | | 7 | 316 |
| 23 | | | 2 | 326 |
| 24 | | | 2 | 395 |
| 25 | | | 24 | 423 |
| 26 | | | | |
| 27 | | | | |
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| 40 | | | | |

INFORMATION ONLY

RADIOLOGICAL SAFETY

Continuation Sheet

SURVEY RESULTS

INFORMATION ONE

93

CONTINUATION SHEET

| REMOVABLE COUNTS | | TOTAL COUNTS | |
|---------------------|------|-----------------|------|
| ALPHA | BETA | ALPHA | BETA |
| 1 | | 15 | 806 |
| 2 | | 11 | 516 |
| 3 | | 5 | 449 |
| 4 | | 9 | 401 |
| 5 | | 18 | 502 |
| 6 | | 11 | 359 |
| 7 | | 4 | 411 |
| 8 | | 4 | 296 |
| 9 | | 15 | 322 |
| 10 | | 4 | 398 |
| 11 | | 3 | 292 |
| 12 | | 22 | 425 |
| 13 | | | |
| 14 | | | |
| 12 | | | |
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| 30 | | | |
| 31 | | | |
| 32 | | | |
| 33 | | | |
| 34 | | | |
| 35 | | | |

| REMOVABLE COUNTS | | TOTAL COUNTS | |
|---------------------|------|-----------------|------|
| ALPHA | BETA | ALPHA | BETA |
| 36 | | 16 | 514 |
| 37 | | 24 | 425 |
| 38 | | | |
| 39 | | | |
| 40 | | | |
| 41 | | | |
| 42 | | | |
| 43 | | | |
| 44 | | | |
| 45 | | | |
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| 68 | | | |
| 69 | | | |
| 70 | | | |
| 71 | | | |

Survey Type CONTAMINATION SURVEY

| | |
|-----------|------------------------|
| Building: | T112c |
| Location: | 280 Yard |
| Purpose: | MARSSIM Release Survey |

Date: 08-05-99 Time: 14:30

RCT: _____
Print name _____
Signature _____

RCT: _____
Print name _____
Signature _____

Comments: All results in scans were approx. equal to background except hi points of each grid noted on page 2

Alpha removable was a two minute count.

SURVEY RESULTS

Date Reviewed: 8/13/94 RS Supervision:

Signature _____

95

RADIOLOGICAL SAFETY

Continuation Sheet

SURVEY RESULTS

Date Reviewed:

8/13/99

RS Supervision:

Print Name: S Enethal

Signature

Electra Performance Test Log

| | | | | | | | | | |
|--------------------------------------------------------|-------------|--------------------------------------------------|------------------------------------------------------------|---------------------------------------------------|-------------------------------|--------------------------------------------------|-----------------------------------------------|----------------------------------------------------------------------------|---------------|
| Instrument Serial Number <u>1682</u> | | | Instrument Efficiency Alpha <u>22.2%</u> Beta <u>30.1%</u> | | | | Instrument Calibration Due Date <u>2-4-00</u> | | |
| Source Serial Number <u>680141</u> <u>603927</u> | | Calibration Due Date <u>N/A</u> <u>N/A</u> | | Source Act. (dpm) <u>24830</u> <u>22723</u> | | Source Acct. (cpm) <u>5512</u> <u>6840</u> | | Source Acceptable Range (sq) <u>4410 to 6615</u> <u>5472 to 8208</u> | |
| Date | ALPHA BKGD3 | ALPHA Reading (Corrected cpm)3 | ALPHA Pass/Fail | BETA Bkgd 3 | BETA Reading (Corrected cpm)3 | BETA Pass/Fail | RCT Employee Number | RCT NAME (Print) | RCT Signature |
| 8/5/99 | 0 | 4950 | PASS | 486 | 6555 | PASS | | WVW02 | |
| 8/10/99 | 1 | 5010 | PASS | 526 | 6008 | PASS | | G. HASENKAUF | |
| 8/11/99 | 2 | 5110 | PASS | 481 | 6392 | PASS | | G. HASENKAUF | |
| 8/12/99 | 2 | 5170 | PASS | 502 | 7173 | PASS | | G. HASENKAUF | |
| 8/13/99 | 2 | 4950 | PASS | 507 | 6987 | PASS | | G. HASENKAUF | |
| 8/16/99 | 2 | 4940 | PASS | 437 | 6684 | PASS | | WVW02 | |
| 1/1 | | | | | | | | | |
| 1/1 | | | | | | | | | |
| 1/1 | | | | | | | | | |
| 1/1 | | | | | | | | | |
| 1/1 | | | | | | | | | |
| 1/1 | | | | | | | | | |
| 1/1 | | | | | | | | | |

1. Source activity in cpm is equal to the source activity in dpm multiplied by the efficiency.

2. Acceptable range is a + 20% (source activity in cpm multiplied by 0.8 or 1.2).

3. All counts are to be 1 minute in duration.

NOTE: If the instrument will be used for alpha measurements only, the beta portion of the test log should be lined through. If the instrument will be used for beta only, then the alpha portion should be lined through.

REVIEWED BY:

LN Cooper

RO SUPERVISOR PRINT NAME

LN Cooper

RO SUPERVISOR SIGNATURE

18-17-99

DATE

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

INSRUMENT DATA

| | | |
|----------------|------------|------------|
| SAIC | Mfg. | Mfg. |
| Model AP-2 | Model | Model |
| Serial# A146 | Serial# | Serial# |
| Cal Due Oct-99 | Cal Due | Cal Due |
| Bkg. N/A | Bkg. | Bkg. |
| Efficiency N/A | Efficiency | Efficiency |
| MDA N/A | MDA | MDA |

Survey Type: Alpha Spectroscopy

Building: T112A

Location: Metal Roof

Purpose: RSP/RF RCM Compliance

RWP #: N/A

Date: 07/20/99

Time: Day

RCT: R. E. Read

Print name

Signature

RCT: N/A

Print name

Signature

Emp. #

PRL #:

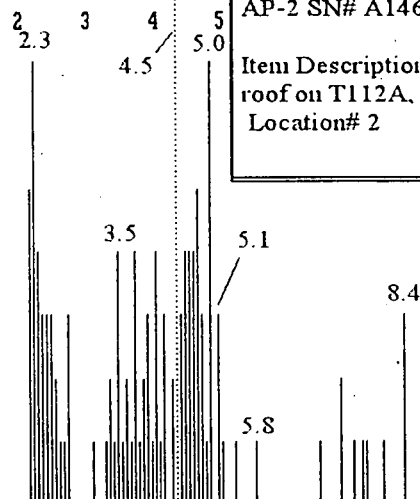
Comments: Both Count Times were 60 mins. In both cases detector columnator was approx. 1/16th to 1/8th in. above sample surface, which might skew spectrum to the left.

SURVEY RESULTS

990720.SPE
REC# 2 OF 3
MIN: 0
MAX: 8
RANGE: 8
SCALE: MIN to MAX
Cursor MEV: 4.5
COUNT: 8
Pu239 Cts: 32
Radon Cts: 11
Gross Cts: 121

AP-2 SN# A146

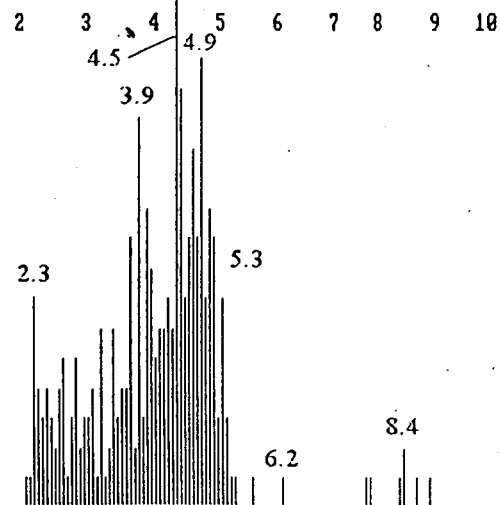
Item Description: Metal
roof on T112A
Location# 1



990720.SPE
REC# 3 OF 3
MIN: 0
MAX: 17
RANGE: 17
SCALE: MIN to MAX
Cursor MEV: 2.3
COUNT: 7
Pu239 Cts: 91
Radon Cts: 8
Gross Cts: 290

AP-2 SN# A146

Item Description: Metal
roof on T112A,
Location# 2



Reviewed: 7-21-99

RS Supervision:

LN Cooper
Print Name

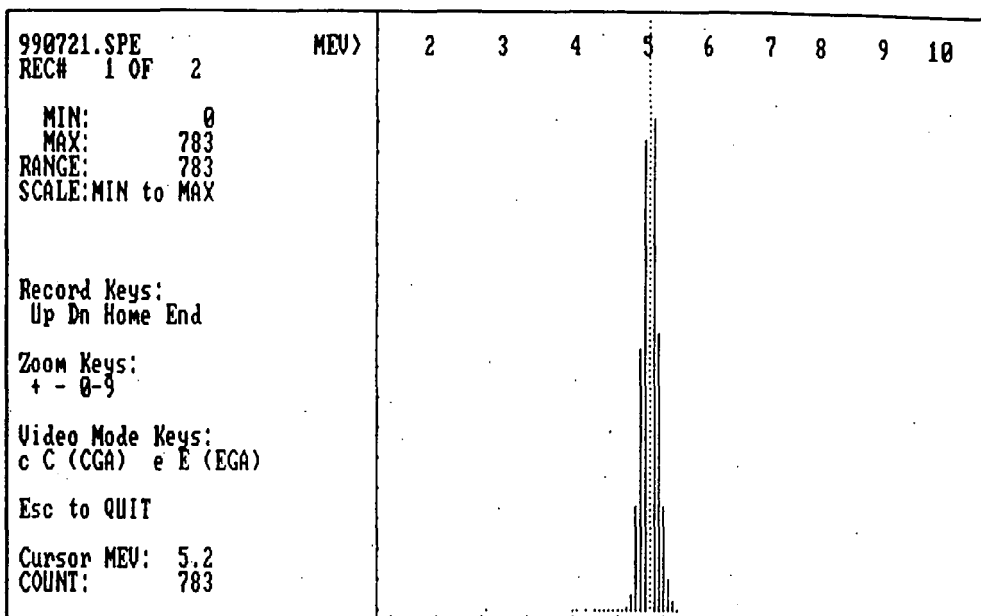
Signature

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

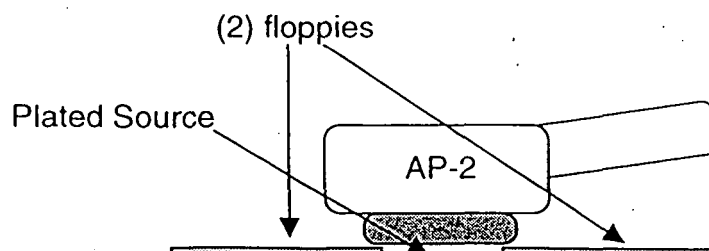
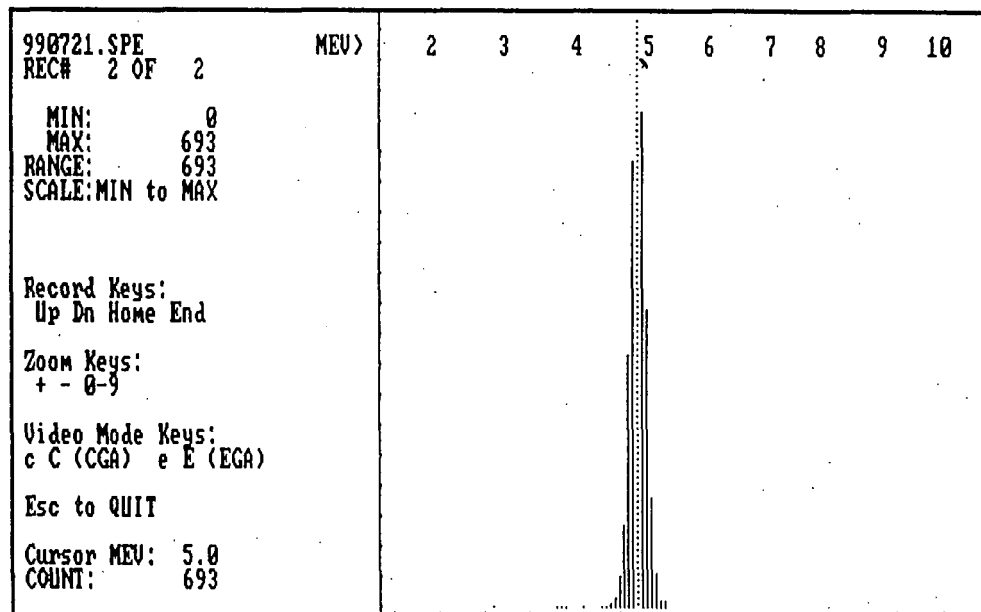
RADIOLOGICAL SAFETY

Drawing Showing Survey Points

This spectrum was taken with probe directly on the surface of the plated source.



This spectrum was taken with probe approx. 1/8th in above surface of the same source.



Page 1 of 2

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

INSRUMENT DATA

| | | |
|------------------------|------------------------|-------------------------------|
| Mfg. <u>EBERLINE</u> | Mfg. <u>EBERLINE</u> | Mfg. <u>NE</u> |
| Model <u>SAC-4</u> | Model <u>SAC-4</u> | Model <u>ELECTRA</u> |
| Serial# <u>861</u> | Serial# <u>842</u> | Serial# <u>1665</u> |
| Cal Due <u>12/7/99</u> | Cal Due <u>12/9/99</u> | Cal Due <u>9/19/99</u> |
| Bkg. <u>0</u> | Bkg. <u>0</u> | Bkg. <u>1 / 556</u> |
| Efficiency <u>0.33</u> | Efficiency <u>0.33</u> | Efficiency <u>.225 / .299</u> |
| MDA <u><20</u> | MDA <u><20</u> | MDA <u>33 / 361</u> |

| | | |
|------------------------|-------------------------|------------------|
| Mfg. <u>EBERLINE</u> | Mfg. <u>EBERLINE</u> | Mfg. _____ |
| Model <u>BC-4</u> | Model <u>BC-4</u> | Model _____ |
| Serial# <u>704</u> | Serial# <u>702</u> | Serial# _____ |
| Cal Due <u>9/25/99</u> | Cal Due <u>11/20/99</u> | Cal Due _____ |
| Bkg. <u>35</u> | Bkg. <u>40</u> | Bkg. _____ |
| Efficiency <u>0.25</u> | Efficiency <u>0.25</u> | Efficiency _____ |
| MDA <u><200</u> | MDA <u><200</u> | MDA _____ |

Survey Type: CONTAMINATIONBuilding: T-112 ALocation: RoofPurpose: Pre-Job SurveyRWP #: N/ADate: 07/20/99Time: 1300RCT: S. Jablkowski

Print name

Signature

Emp. #

RCT: 1

Print name

Signature

Emp. #

PRL #: _____

Comments: Pre-Job survey on roof for drilling sample.

(SEE MAP)

TOTAL ALPHA READINGS ARE
ONE MINUTE P.A.T.S.

SURVEY RESULTS

Map

| Swipe | Location/Description Results in DPM/100sq cm | Removable | | Total | | Swipe # | Location/Description Results in DPM/100sq cm | Removable | | Total | |
|-------|-------------------------------------------------|-----------|------|-------|------|---------|-------------------------------------------------|-----------|------|-------|------|
| | | Alpha | Beta | Alpha | Beta | | | Alpha | Beta | Alpha | Beta |
| | See Map | <20 | <200 | 186 | <361 | | | | | | |
| | | <20 | <200 | 144 | <361 | | | | | | |
| 3 | | | | | | | | | | | |
| 4 | | | | | | | | | | | |
| 5 | | | | | | | | | | | |
| 6 | | | | | | | | | | | |
| 7 | | | | | | | | | | | |
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| 16 | | | | | | | | | | | |
| 17 | | | | | | | | | | | |
| 18 | | | | | | | | | | | |
| 19 | | | | | | | | | | | |
| 20 | | | | | | | | | | | |

e Reviewed: 7-21-99 RS Supervision: _____

Print Name

Signature

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE**INSRUMENT DATA**

| | | |
|------------------------|------------------------|----------------------------|
| Mfg. EBERLINE | Mfg. EBERLINE | Mfg. NE |
| Model SAC-4 | Model SAC-4 | Model ELECTRA |
| Serial# 861 | Serial# 842 | Serial# 1425 |
| Cal Due 12/7/99 | Cal Due 12/9/99 | Cal Due 8/25/99 |
| Bkg. 0.3 | Bkg. 0 | Bkg. 2 / 548 |
| Efficiency 0.33 | Efficiency 0.33 | Efficiency 21 / 316 |
| MDA <20 | MDA <20 | MDA 44 / 366 |

| | | |
|------------------------|-------------------------|------------------|
| Mfg. EBERLINE | Mfg. EBERLINE | Mfg. _____ |
| Model BC-4 | Model BC-4 | Model _____ |
| Serial# 704 | Serial# 702 | Serial# _____ |
| Cal Due 9/25/99 | Cal Due 11/20/99 | Cal Due _____ |
| Bkg. 36 | Bkg. 43 | Bkg. _____ |
| Efficiency 0.25 | Efficiency 0.25 | Efficiency _____ |
| MDA <200 | MDA <200 | MDA _____ |

Survey Type: **CONTAMINATION**Building: **T-112 A**Location: **Roof**Purpose: **Post-Job Survey**RWP #: **N/A**Date: **07/21/99**Time: **1500**RCT: **S. Jablkowski**

Print name

Signature

Emp. #

RCT: **N/A**

Print name

Signature

Emp. #

PRL #: **N/A**Comments: **Post-Job survey on roof for sampling.****(SEE MAP)****SURVEY RESULTS****Map**

| Sp | Location/Description Results in DPM/100sq cm. | Removable | | Total | | Swipe # | Location/Description Results in DPM/100sq cm. | Removable | | Total | |
|----|--------------------------------------------------|-----------|------|-------|------|------------|--------------------------------------------------|-----------|------|-------|------|
| | | Alpha | Beta | Alpha | Beta | | | Alpha | Beta | Alpha | Beta |
| | See Map | <20 | <200 | 102 | <366 | | | | | | |
| 2 | | <20 | <200 | 24 | <366 | | | | | | |
| 3 | | <20 | <200 | 12 | <366 | | | | | | |
| 4 | | <20 | <200 | 114 | <366 | | | | | | |
| 5 | | | | | | | | | | | |
| 6 | | | | | | | | | | | |
| 7 | | | | | | | | | | | |
| 8 | | | | | | | | | | | |
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| 16 | | | | | | | | | | | |
| 17 | | | | | | | | | | | |
| 18 | | | | | | | | | | | |
| 19 | | | | | | | | | | | |
| 20 | | | | | | | | | | | |

COPYReviewed: **7/21/99**RS Supervision: **S. Englund**

Print Name

Signature

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

INSTRUMENT DATA

| | | |
|------------|------------|------------|
| SAIC | Mfg. | Mfg. |
| Model | Model | Model |
| Serial# | Serial# | Serial# |
| Cal Due | Cal Due | Cal Due |
| Bkg. | Bkg. | Bkg. |
| Efficiency | Efficiency | Efficiency |
| MDA | MDA | MDA |
| Mfg. | Mfg. | Mfg. |
| Model | Model | Model |
| Serial# | Serial# | Serial# |
| Cal Due | Cal Due | Cal Due |
| Bkg. | Bkg. | Bkg. |
| Efficiency | Efficiency | Efficiency |
| MDA | MDA | MDA |

Survey Type: Alpha Spectroscopy

Building: T112A

Location: Metal Roof

Purpose: RSP/RF RCM Compliance

RWP #: N/A

Date: 07/20/99

Time: Day

RCT: R. E. Read

Print name

Signature

RCT: N/A

Print name

Signature

Emp. #

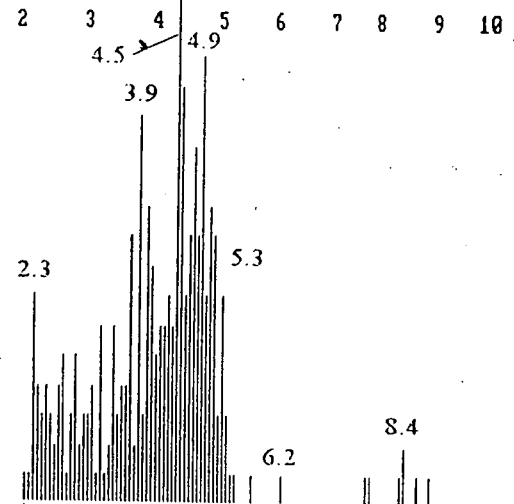
PRL #:

Comments: Both Count Times were 60 mins. In both cases detector columnator was approx. 1/16th to 1/8th in. above sample surface, which might skew spectrum to the left.

SURVEY RESULTS

990720.SPE
REC# 3 OF 3 MEV>

MIN: 0
MAX: 17
RANGE: 17
SCALE: MIN to MAX
Cursor MEV: 2.3
COUNT: 7
Pu239 Cts: 91
Radon Cts: 8
Gross Cts: 290

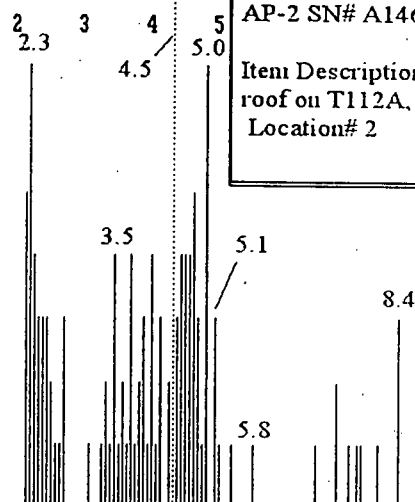


990720.SPE
REC# 2 OF 3 MEV>

MIN: 0
MAX: 8
RANGE: 8
SCALE: MIN to MAX
Cursor MEV: 4.5
COUNT: 8
Pu239 Cts: 32
Radon Cts: 11
Gross Cts: 121

AP-2 SN# A146

Item Description: Metal
roof on T112A
Location# 1



Reviewed: 7-21-99 RS Supervision: LNC Cooper

Print Name

Signature

Page 1 of 2

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

INSURUMENT DATA

| | | |
|-----------------|-----------------|-----------------------|
| Mfg. EBERLINE | Mfg. EBERLINE | Mfg. NE |
| Model SAC-4 | Model SAC-4 | Model ELECTRA |
| Serial# 861 | Serial# 842 | Serial# 1425 |
| Cal Due 12/7/99 | Cal Due 12/9/99 | Cal Due 8/25/99 |
| Bkg. 0.3 | Bkg. 0 | Bkg. 2 / 548 |
| Efficiency 0.33 | Efficiency 0.33 | Efficiency .21 / .316 |
| MDA <20 | MDA <20 | MDA 44 / 366 |

| | | |
|-----------------|------------------|------------|
| Mfg. EBERLINE | Mfg. EBERLINE | Mfg. |
| Model BC-4 | Model BC-4 | Model |
| Serial# 704 | Serial# 702 | Serial# |
| Cal Due 9/25/99 | Cal Due 11/20/99 | Cal Due |
| Bkg. 36 | Bkg. 43 | Bkg. |
| Efficiency 0.25 | Efficiency 0.25 | Efficiency |
| MDA <200 | MDA <200 | MDA |

Survey Type: CONTAMINATION

Building: T-112 A & B

Location:

Purpose: Unrestricted Release

RWP #:

Date: 07/21/99

Time: 1445

RCT: S. Jablowski

Print name

Signature

Emp. #

RCT:

Print name

Signature

Emp. #

PRL #: 99-549-169

Comments: (8) Sampling bottles, #99A8967-001.001, 001.002, 002.001, 002.002, 003.001, 003.002, 004.001, 004.002

(SEE MAP)

SURVEY RESULTS

Map

| | Location/Description Results in DPM/100sq cm | Removable | | Total | | Swipe # | Location/Description Results in DPM/100sq cm | Removable | | Total | |
|----|-------------------------------------------------|-----------|------|-------|------|------------|-------------------------------------------------|-----------|------|-------|------|
| | | Alpha | Beta | Alpha | Beta | | | Alpha | Beta | Alpha | Beta |
| | See Map | <20 | <200 | <44 | <366 | | | | | | |
| 2 | | <20 | <200 | <44 | <366 | | | | | | |
| 3 | | <20 | <200 | <44 | <366 | | | | | | |
| 4 | | <20 | <200 | <44 | <366 | | | | | | |
| 5 | | <20 | <200 | <44 | <366 | | | | | | |
| 6 | | <20 | <200 | <44 | <366 | | | | | | |
| 7 | | <20 | <200 | <44 | <366 | | | | | | |
| 8 | | <20 | <200 | <44 | <366 | | | | | | |
| 9 | | | | | | | | | | | |
| 10 | | | | | | | | | | | |
| 11 | | | | | | | | | | | |
| 12 | | | | | | | | | | | |
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| 16 | | | | | | | | | | | |
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| 18 | | | | | | | | | | | |
| 19 | | | | | | | | | | | |
| 20 | | | | | | | | | | | |

COPY

Reviewed: 7-21-99 RS Supervision:

LN Cooper

Print Name

Signature

| | | |
|------------------------------------------------------------------------|----------------------------|------------------------|
| Survey Area: T112 | Survey Unit: Unit D | Building: T112A |
| Survey Unit Description: Office trailer – Pre Demolition Survey | | |

SURVEY PACKAGE COVER SHEET

Building Information

Classification: Type 1 ☒ Type 2 ☐ Type 3 ☐

Contaminants of Concern: Plutonium ☒ Uranium ☒ Other ☐

Special Support Requirements

Survey points randomly generated by Radiological Engineering

Special Safety Precautions



Per 3-PRO-165-RSP-07.02, "Contamination Monitoring Requirements" and IWCP

Labeling Requirements

Not Applicable

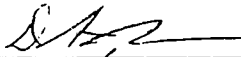
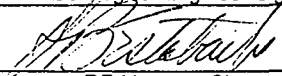
Survey Package Implementation

This survey package is ready for implementation.

| | | | |
|------------------------------------|--|--------------------------------------------------------------------------------------|--------|
| D. A. BARNES | |  | 8-3-99 |
| Radiological Engineer Printed Name | | Radiological Engineer Signature | Date |
| H. B. ESTABROOKS | |  | 8/3/99 |
| RE Peer Review Printed Name | | RE Peer Review Signature | Date |

Survey Package Closure

All required reviews are complete, and data analysis results meet RLCP criteria. Survey package is authorized for closure.

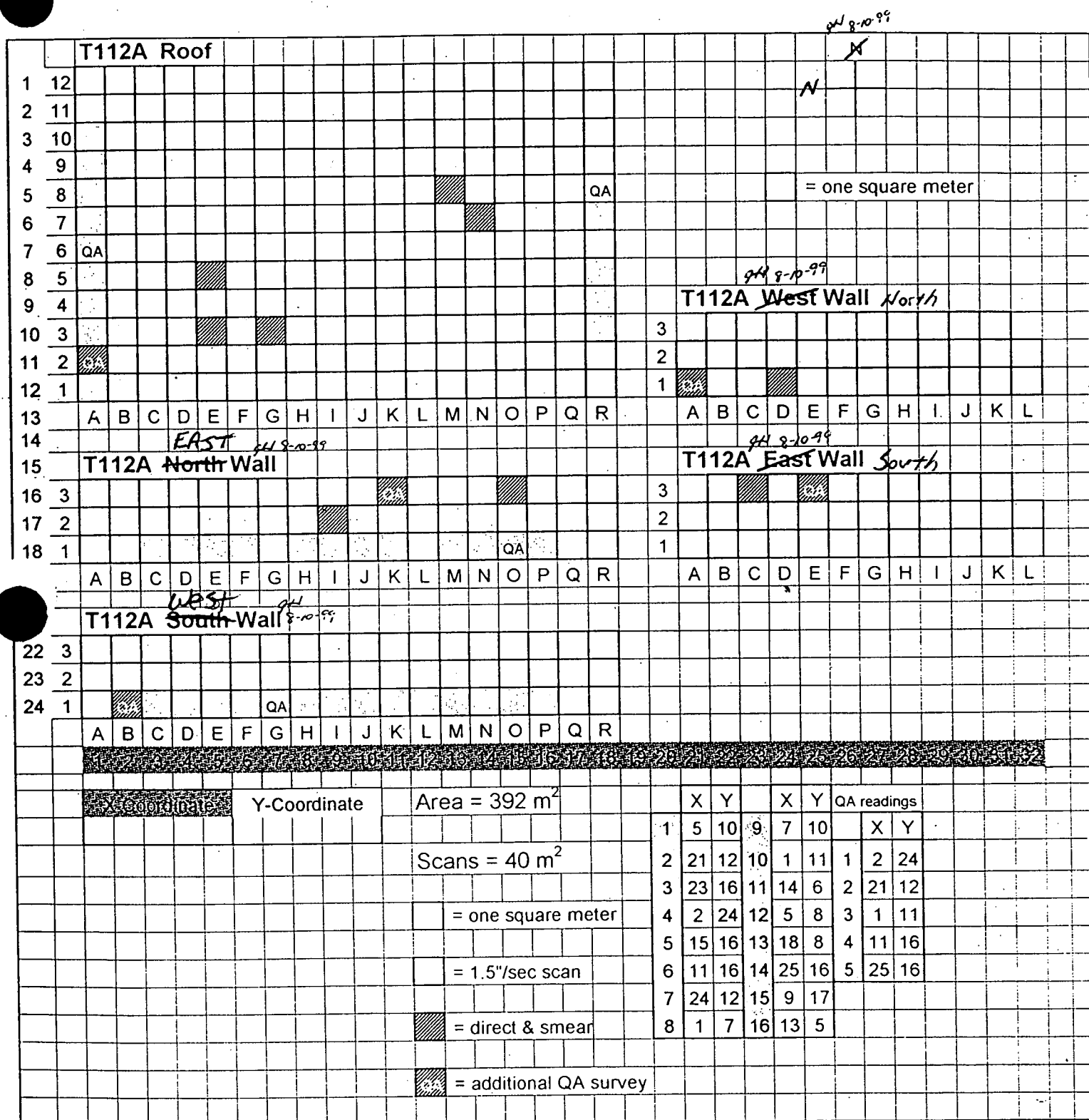
| | | | |
|------------------------------------|--|--------------------------------------------------------------------------------------|---------|
| D. A. BARNES | |  | 8-19-99 |
| Radiological Engineer Printed Name | | Radiological Engineer Signature | Date |
| Es ESTABROOKS | |  | 8/19/99 |
| RE Manager Printed Name | | RE Manager Signature | Date |

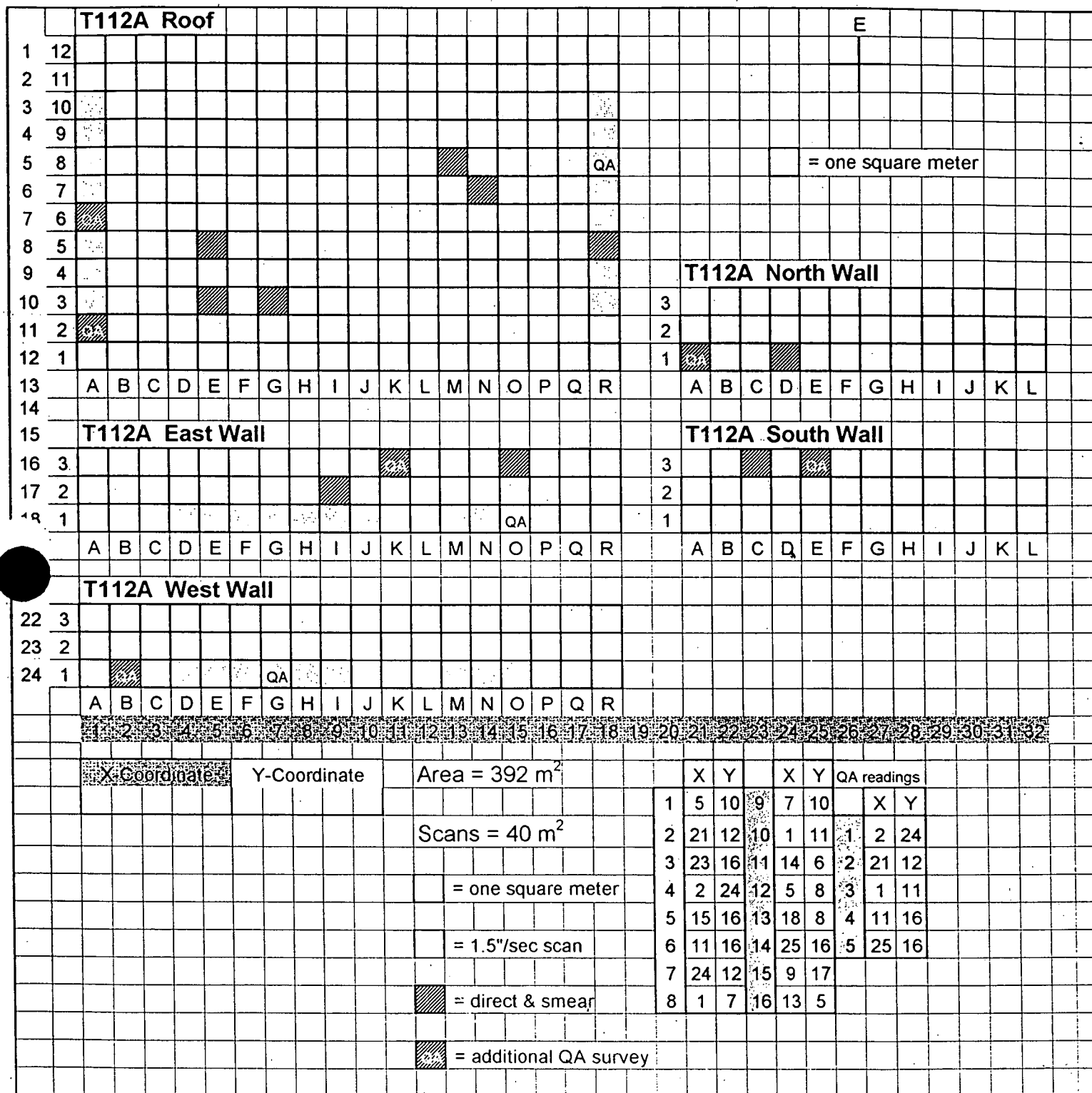
| | | |
|------------------------------------------------------------------------|----------------------------|------------------------|
| Survey Area: T112 | Survey Unit: Unit C | Building: T112C |
| Survey Unit Description: Office trailer – Pre Demolition Survey | | |

SAMPLING AND SURVEY INSTRUCTIONS

| Minimum Survey & Sample Measurement Requirements | | |
|--------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Measurement | Amount & Type | Comments |
| Surface Activity Measurements: | 16 survey points (alpha & beta, direct & removable) on trailer surfaces. 5 duplicate survey points for QA purposes. | Representative surveys of the area will be taken for total and removable, alpha and beta contamination in accordance with 3-PRO-165-RSP-07.02, "Contamination Monitoring Requirements" and IWCP The RCT will document the readings of all surveys performed. QA survey points done by different RCT Duplicate smears will be taken at a directly adjacent location. |
| Surface Scanning: | 10% scan surveys on trailer surfaces. 5% duplicate scan areas for QA purposes. | 1 m ² scan surveys will be performed at locations indicated. Scan surveys of the area will be taken for alpha and beta contamination at a scan rate of 1.5 inches per second. QA scan areas done by different RCT |
| Media Samples: | None | None |
| Volumetric Samples: | None | None |

14/23







September 23, 1997

Alan Parker
Vice President
Closure Projects Int.
Kaiser-Hill, L. L. C.

| | | | |
|------------------------|--|--------------|--------------|
| Post-It® Fax Note 7671 | | Date 7/26 | # of pages 2 |
| To Dave Barnes | | From Barraso | |
| Co./Dept. | | Co. | |
| Phone # | | Phone # 8451 | |
| Fax # 8048 | | Fax # 8027 | |

RADIOLOGICAL REQUIREMENTS FOR RELEASE OF THE 690 AND 891 TRAILER CLUSTERS - DJH-028-97

At your request, Radiological Engineering is documenting the series of events that have taken place with the radiological surveys and laboratory analysis performed on the 690 Trailer cluster as well as the 891 trailers. Based on the following information, Radiological Engineering will proceed with Property/Waste Release Evaluations (P/WRE) for the unrestricted release of the 690 Trailer cluster and the 891 Trailer cluster. (The 690 trailer cluster is composed of trailers T690 A, B, C, D, E, F, G, H, I, J, K, L, M, T371G and T444A, and the 891 trailer cluster includes trailers T891 A, L, M, N and T900E.)

Starting in early summer, Radiological Engineering approved survey plans to survey the interior of the 690 Trailer Cluster and the 891 trailer cluster. The survey frequency was based on guidance from NUREG 5849, "Manual for Conducting Radiological Surveys in Support of License Termination" and the guidance in MARSSIM, "Multi-Agency Radiation Survey and Site Investigation Manual". Based on process history, surveys were only required on the Trailer interiors and on certain exterior equipment including the T690K exhaust ducting.

In August, 1997, an RCT performed surveys on the T690K exhaust ducting and found no fixed or removable contamination above the release limits. After the RCT performed the duct survey, he placed his survey instrument on an exterior rusted metal support and noticed elevated alpha activity. This led to additional exterior surveys which also detected elevated alpha activity averaging around 200 dpm/100cm² fixed with no removable which would be above the unrestricted release criteria assuming the alpha activity was from transuranics (e.g. plutonium).

At this point Radiological Safety characterized this elevated area with a hand-held alpha analyzer (SAIC Model AP-2) to determine the isotope. The spectrum revealed a predominant peak in the 5 MeV energy range which is indicative of plutonium. Additional characterization surveys of the 690 trailers with the AP-2 also indicated plutonium. This led to additional surveys of both the 690 and 891 trailers which all had elevated alpha activity with the roofs and rusted horizontal areas having the most activity. Radiological Safety then launched an extensive effort to bound the size of the elevated alpha activity measurements across the site. Elevated readings were measured on the roofs of the 891 trailers. Days later, surveys on a cargo container near T130B revealed elevated alpha activity in the 200 dpm/100cm² range.

Given the wide spread nature of this phenomena, and the fact that it just didn't make sense that the origin of this elevated activity could be from Rocky Flats activities, metal roof samples were taken from the 690 trailers and sent to the B559 labs and B881 labs on-site and to an offsite lab in Charleston, South Carolina. Attached are the results from these laboratories. The final conclusions from all of the labs is that the

P.O. Box 464 • Golden, CO 80402-0464



radioactivity on the roofing material was from naturally occurring radionuclides. The attached laboratory results document this conclusion. The energy level of some of the naturally occurring isotopes is very close to that for plutonium-239 (^{239}Pu); for example Polonium-210 (^{210}Po) has an alpha energy of 5.3 MeV and the alpha energy for ^{239}Pu is 5.1 MeV. With the AP-2 it is evidently very difficult to discriminate between ^{239}Pu and ^{210}Po . The laboratory analysis process, in contrast to the AP-2 field acquisition, is performed in a controlled laboratory environment, has a much higher degree of resolution and therefore allows the lab to make this discrimination.

Based on the laboratory data, the isotopes are not uranium, plutonium or americium. The laboratory results indicate that the source of this activity is from isotopes found in naturally occurring decay chains. Many of the isotopes are short lived, and the total activity is below release criteria. Therefore, Radiological Engineering will proceed with the issuance of the P/WREs which will provide the final authorization to release the trailers. The interior of the 690 and 891 trailers, however, are still required to be surveyed in accordance with the original decommissioning survey plans. This laboratory data also supports the original Radiological Engineering determination that the 690 trailer exteriors could be free released without radiological surveys based on process history. This same process history applies to the 891 trailer exteriors which, based on their age, location and usage, can be free released without exterior surveys. It should also be noted that not all trailers and buildings fall into the category of "no surveys required" for the exterior. Each trailer/building is evaluated on a case by case basis.

Based on all of these recent findings, Radiological Engineering developed a corrective action plan for future AP-2 usage. Radiological Engineering suspended the use of the AP-2 on 9/18/97 and briefed the Radiological Engineering department on the recent AP-2 findings as the first step of this corrective action plan. This action is necessary to prevent further field misinterpretation of AP-2 readings. The action plan also requires a revision to the AP-2 procedure and requires review of the Job Performance Measures (JPM) in the AP-2 training package for evaluating and approving AP-2 results. The AP-2 will not be re-authorized for use until the conditions in the action plan are met. In addition, Radiological Engineering will continue to investigate the mechanism that is causing this elevated activity to deposit on the trailers.

Please contact Jeff Barroso at Extension 8451 if you have any additional questions.

Don Harward

Don Harward
Division Manager
Radiological Safety

JBB:llm

Attachment:
As Stated

CORRES. CONTROL
INCOMING LTR NO.

629 RF 98

DUE DATE

ACTION

States Government

Memorandum

APR 23 1998

AME:TAD:PPP:02637

Application of Surface Contamination Guidelines from DOE Order 5400.5

Wynn A. Harding, Vice President
Safety Systems and Engineering
Kaiser-Hill Company, L.L.C.

Reference: Ltr, Harding to Lowe, 98-RF-00974, subject: same, dtd 3/10/98

The Kaiser-Hill Company, L.L.C. (Kaiser-Hill) requested approval of the interpretations for surface contamination as set forth in the reference above. The Rocky Flats Field Office concurs with your interpretation because the conservative nature of the proposed approach is consistent with the guidelines specified in the Final Multi-Agency Radiation Survey and Site Investigation Manual.

David C. Lowe
Assistant Manager for Engineering

cc:
P. Psomas, TAD, RFFO

| DIST. | LTR | ENC |
|------------------|-----|-----|
| BACON, R.F. | X | |
| BENSUSSEN, S.J. | | |
| BORMOLINI, A.M. | | |
| BOYTER, N.C. | | |
| BRAILSFORD, M.D. | | |
| BURDGE, I. | | |
| CARD, R.G. | | |
| COSGROVE, M.M. | | |
| COULTER, W.L. | | |
| CRAWFORD, A.C. | | |
| DERBY, S. | | |
| DIETERLE, S.E. | | |
| FERRERA, D.W. | | |
| FERRERA, K.P. | | |
| GERMAIN, A.L. | | |
| GILPIN, H.E. | | |
| HARDING, W.A. | X | |
| HARROUN, W.P. | | |
| HEDAHL, T.G. | | |
| HILL, J.A. | | |
| MARTINEZ, L.A. | | |
| NORTH, K. | | |
| PARKER, A. | | |
| PHILLIPS, F.J. | | |
| RHOADES, D.W. | | |
| RODGERS, A.D. | | |
| IN, N.B. | | |
| S.M.S. | X | |
| R.E. | | |
| N.R. | | |
| HEIS, G.M. | | |
| Barroso, J. | X | |
| Hughes, F. | X | |
| Newland, D.J. | X | |
| Quellid, T. | X | |
| Walker, J. | X | |
| Roberts, P.S. | X | |
| Langha, T. | X | |

| | | |
|--------------|---|---|
| COR CONTROL | X | X |
| ADMIN RECORD | | |
| PATST130G | | |

Reviewed for Addressee
Corres. Control RFP

4/24/98

Date

By

Ref Ltr. #

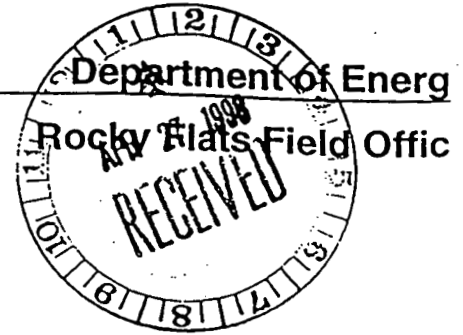
98 RF 00974

ORDER #

5400.5

24 APR 98 12:31

REFETS-CC



98-RF- 00974

| DIST. | LTR | MC |
|------------------|-----|----|
| ISSEN, S. J. | | |
| SFORD, M. D. | | |
| GE, L. | | |
| RD, R. G. | | |
| FERRERA, D. W. | | |
| HARDING, W. A. | X | |
| HILL, J. A. | | |
| KELL, R. E. | | |
| MARTINEZ, L. A. | | |
| PARKER, A. M. | | |
| SPEARS, M. S. | | |
| TILLER, R. E. | | |
| TUOR, N. R. | | |
| VOORHEIS, G. M. | | |
| BACON, R. F. | X | |
| BARROSO, J. B. | X | |
| HARWARD, D. J. | X | |
| HUGHES, F. P. | X | |
| NEWLAND, D. J. | X | |
| OVERLID, T. W. | X | |
| PATTERSON, J. B. | X | |
| ROBERTS, R. S. | X | |
| VAUGHN, T. L. | X | |

| | |
|-----------------------|---|
| ES. CONTROL | X |
| ADMIN RECD/080 | |
| TRAFFIC | |
| PATS/1130G | |
| CLASSIFICATION: | |
| UCNI | |
| UNCLASSIFIED | X |
| CONFIDENTIAL | |
| SECRET | |
| AUTHORIZED CLASSIFIER | |

SIGNATURE: *[Signature]*
Date: 3/16/98
IN REPLY TO RFP CC NO.: N/A

ACTION ITEM STATUS:
PARTIAL/OPEN ☐
CLOSED ☐

LTR APPROVALS:
ORIG. & TYPIST INITIALS:
RSR:cjb
RF-46469 (Rev. 2/28/97)



March 10, 1998

98-RF-009

David C. Lowe
Assistant Manager for Engineering
DOE, RFFO

APPLICATION OF SURFACE CONTAMINATION GUIDELINES FROM DEPARTMENT OF ENERGY ORDER 5400.5 - WAH-064-98

Kaiser-Hill requests that DOE, RFFO approve Kaiser-Hill's interpretation of Department of Energy (DOE) Order 5400.5, Figure IV-1, "Surface Contamination Guidelines." This interpretation concerns how a surface can be evaluated with respect to the "Allowable Total Residual Surface Contamination" (ATRSC) in Figure IV-1.

Historically, compliance with the ATRSC limits has been met at the Rocky Flats Environment Technology Site (RFETS) by surveying items or areas with direct reading radiation detection equipment. This radiation detection equipment can only detect radioactive material located directly on a surface. Therefore, it currently needs to be assured that all radioactive material present on the surface of the item, or area being surveyed to show compliance with the ATRSC limits. In some instances radioactive material may have penetrated into the surface of a material to a limited degree (e.g., a spill of radioactive material in liquid form on a concrete floor), or radioactive material may be present in a material on a surface (e.g., radioactive material present in a coating of paint). In these cases, the current methods for assuring compliance with the ATRSC limits in DOE Order 5400.5 are not sufficient. Alternative methods need to be developed to assure compliance.

Kaiser-Hill believes that the ATRSC limits may be applied to materials that contain radioactive material if this radioactive material is evaluated with a conservative approach that is appropriate to the situation. The following outlines this approach:

1. For a given surface type (i.e., concrete surface, paint sample, etc.), a sample will be taken of the surface to the depth of the radioactive material present (i.e., to a 1 cm depth of the concrete, to the depth of the paint, etc.)
2. The sample will be taken from a defined area of the surface (i.e., from a 10 cm X 10 cm area, from a 10 inch X 10 inch area, etc.)
3. The sample will be analyzed for radioactive material indicative of RFETS (i.e., plutonium, americium, uranium, etc.)

Kaiser-Hill Company, L.L.C.

Courier Address: Rocky Flats Environmental Technology Site, State Hwy. 93 and Cactus, Rocky Flats, CO 80007 • 303.966.7000

Mailing Address: P.O. Box 464, Golden, Colorado 80402-0464

David C. Lowe
March 10, 1998
98-RF-00974
Page 2

4. The amount of radioactive material in the sample is then uniformly distributed over the sample area so that the amount of radioactive material present in the sample is in the units of dpm/100cm²
5. This quantity is then compared with the ATRSC limits.

This approach is conservative and appropriate in that all the radioactive material contained in the surface is concentrated at the top of the surface and then compared with the ATRSC limits. Therefore, the "Total" amount of radioactive material present is being compared with the ATRSC limits. Also, this is conservative and appropriate since it is much harder for the radioactive material contained in a surface to come into contact with an individual than if the radioactive material is present on the surface. This approach is also consistent with the approach in Section 7.5.2.2, "Sample Content," of the Final MARSSIM (Multi-Agency Radiation Survey and Site Investigation Manual).

Kaiser-Hill believes that the above approach should be used when evaluating radioactive material that is contained in a surface. Kaiser-Hill requests that DOE, RFFO approve Kaiser-Hill's approach to complying with DOE Order 5400.5, Figure IV-1 by March 30, 1998 to support the Building 123 & 779 Deactivation and Decommissioning projects.

If you have any questions or comments, please contact Rick Roberts at Extension 4869 or Jeff Barroso at Extension 8451.


Wynn A. Harding
Vice-President
Safety Systems & Engineering
Kaiser-Hill Company, L.L.C.

RSR:cjb

Orig. and 1 cc - David C. Lowe

CASE NARRATIVE**RIN 99A8967****Laboratory Report Identification Number: 1643****PSA Module RC01B.3**

August 9, 1999

I. Introduction

On April 27, 1999, four waste samples, (RIN 99A8967), were received for analysis at the Sanford Cohen and Associates (SC&A) Southeastern Environmental Laboratory, located in Montgomery, Alabama. The chain-of-custody accompanying the samples requested they be analyzed on a "rush" basis. The samples were analyzed in accordance with Kaiser-Hill specifications stated in the "Statement of Work for Analytical Measurements, Isotopic Determinations by Alpha Spectrometry, Module RCO1-B.3", dated April 24, 1998, and Modification 09, dated July 16, 1998.

II. Analytical Methodology

The radioanalytical results reported for each sample include the site and laboratory sample identification numbers, collection date, method of analysis, and the quality control samples that were analyzed concurrently. All samples were analyzed by an Eichrom Industries, Inc. extraction chromatography method (ACW03) for isotopic uranium, plutonium, and americium.

III. Analytical ResultsDeficiencies

See Reanalysis.

Matrix Interferences

There were no indications of matrix interference.

Dilutions

No dilutions were required.

Detection Limits

The required detection limits (RDL) were met for all sample analyses.

**PRELIMINARY
INFORMATION**

Reanalysis

The Am-243 tracer recovery in samples KH199-1643-03, KH199-1643-04 was less than the 20% specified in the SOW. The samples were reanalyzed beginning with sample preparation and the results were acceptable. The Original and Reanalysis Sample I.D. are listed below.

| Original Laboratory Sample I.D. | Reanalysis Laboratory Sample I.D. | Analysis Type |
|---------------------------------|-----------------------------------|---------------|
| KH199-1643-03 | KH199-1643-03B | Am-241 |
| KH199-1643-04 | KH199-1643-03B | Am-241 |

Deviations from Protocols

There were no deviations from the written protocols and analytical methods.

Contacts with the CTR

There were no contacts with the contract technical representative (CTR) regarding these samples.

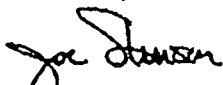
IV. Quality Control

Site Samples Used for Quality Control Samples:

| Site Sample Number | Laboratory Sample Number | Type of Quality Control Analysis Sample |
|-------------------------------|--------------------------|-----------------------------------------|
| Laboratory Type II Water | SCAQC-1643-LC1 | Laboratory Control Sample |
| 99A8967-001.002 T112 A Center | SCAQC-1643-LD1 | Laboratory Duplicate Sample |
| Laboratory Type II Water | SCAQC-1643-PB | Preparation Blank |

The analytical results of all quality control samples met the acceptance criteria specified in the SOW.

Sincerely,



Joe Stinson
Laboratory Manager

8/9/99

Date

PRELIMINARY
INFORMATION

| | | | | | | | |
|--------------------------------------------------------------------------|--|------------------------------------------|--|-------------------------------------------------------------------------------------------------|--|--------------------------------|--|
| Commodon Advanced Sciences, Inc. | | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | | | | C.O.C. # 95-8967#002 | |
| | | | | | | Page 1 of 1 | |
| Collector CE Aught | | Contact/Requester WONTASCEK | | Telephone No. 3123 | | FAX 1314 | |
| RUN 99A8967 | | Sampling Origin T-112 | | Purchase Order/Charge Code 02017100 | | | |
| Project Title N/A | | Logbook No. 94 Van | | Fee Chest No. N/A | | Temp. 72.49 | |
| To (Lab) S. Cohen & Associates | | Method of Ship ment Fe N. EX | | Bill of Lading/Air Bill No. 4533 2124 9819 | | | |
| Protocol CAS-SOP. 003 | | | | OnSite Property No. | | | |
| POSSIBLE SAMPLE HAZARDS/REMARKS possible Tar present in Sample | | | | SPECIAL INSTRUCTIONS KH199-1643- | | | |
| | | | | Hold Time Total Activity Exemption: Yes <input type="checkbox"/> No <input type="checkbox"/> | | | |

| Bottle No. | Container Number | Matrix | Date | Time | Location | No/Type Container | Sample Analysis | Preservative: Packing |
|--------------------|---------------------------|--------|----------------|-------------|----------|-------------------|-----------------------------------|-----------------------|
| 99A8967-001.002 | T112 A Corner | SOLID | 7-21-99 | 1200 | T-112 | 125-G P/G | RC01B003 (Isotopic (Soil)) (Rush) | None 4 degrees C |
| 99A8967-002.002 | T112 A S.W. Corner | SOLID | | 1230 | T-112 | 125-G P/G | RC01B003 (Isotopic (Soil)) (Rush) | None 4 degrees C |
| 99A8967-003.002 | N.W. T112B Corner | SOLID | | 1300 | T-112 | 125-G P/G | RC01B003 (Isotopic (Soil)) (Rush) | None 4 degrees C |
| 99A8967-004.002 | N.E. T112B Corner | SOLID | | 1315 | T-112 | 125-G P/G | RC01B003 (Isotopic (Soil)) (Rush) | None 4 degrees C |
| 66A 7-21-99 | | | | | | | | |
| | | | | | | | | |
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| | | | | | | | |
|-----------------------------------------|----------------------------------|-------------------------------------|----------------------------------|-----------------------------------------|----------------------------------|-------------------------------------|----------------------------------|
| Relinquished By: CE Aught | Date/Time 7-21-99 1500 | Received By: Ref #2 T891R | Date/Time 7-21-99 1500 | Relinquished By: Ref #2 T891R | Date/Time 7-26-99 1500 | Received By: Ref #2 T891R | Date/Time 7-26-99 1500 |
| Relinquished By: J. Christman | Date/Time 7-21-99 1500 | Received By: Fecl EX | Date/Time 7-21-99 1500 | Relinquished By: J. Christman | Date/Time 7-26-99 1500 | Received By: J. Christman | Date/Time 7-26-99 1500 |
| Relinquished By: | Date/Time | Received By: | Date/Time | Relinquished By: | Date/Time | Received By: | Date/Time |
| Relinquished By: | Date/Time | Received By: | Date/Time | Relinquished By: | Date/Time | Received By: | Date/Time |

| | | | |
|--------------------------|-----------------------------------------------------------------------------------|-------------|-----------|
| FINAL SAMPLE DISPOSITION | Disposition Method (e.g., Return to customer, per lab procedure, used in process) | Disposed By | Date/Time |
| | | | |

08/10/99 08:21

S. COHEN & ASSOC *** Seilman/COC/DP

004

Sanford Cohen & Associates Southeastern Environmental Laboratory

Radioanalytical Results

Report Identification Number: 99A5967

| | | |
|--------------------------------------|---------------------------------------------|-------------------------------|
| Project Name: <u>Kalbar-Hill</u> | Chain-of-Custody Number: <u>99A5967#002</u> | Matrix: <u>Waste</u> |
| Site Sample ID: <u>001.002</u> | Collection Date: <u>7/21/99</u> | Date Received: <u>7/27/99</u> |
| Other Sample ID: <u>TL12A CENTER</u> | Batch Number: <u>1843</u> | Laboratory Code: <u>SCA</u> |

| Method Number | Radionuclide | Laboratory Sample ID | Activity (pCi/g) | 2 σ Counting Error (pCi/g) | Total Error (pCi/g) | MDA (pCi/g) |
|---------------|--------------|----------------------|------------------|-----------------------------------|---------------------|-------------|
| ACW03 | U-233/234 | KH189-1843-01 | 0.264 | 0.118 | 0.129 | 0.034 |
| ACW03 | U-238 | KH189-1843-01 | 0.018 | 0.031 | 0.031 | 0.042 |
| ACW03 | U-238 | KH189-1843-01 | 0.270 | 0.120 | 0.132 | 0.060 |
| ACW03 | Pu-239/240 | KH189-1843-01 | 0.000 | 0.000 | 0.000 | 0.046 |
| ACW03 | Am-241 | KH189-1843-01 | 0.000 | 0.000 | 0.000 | 0.086 |



| Quality Control Samples | | | |
|-------------------------|--------------------------------|------------------------------------|------------------------|
| Radionuclide | Laboratory Control Sample (LC) | Laboratory Duplicate Analysis (LD) | Preparation Blank (PB) |
| U | SCAQC-1843-LC1 | SCAQC-1843-LD1 | SCAQC-1843-PB |
| Pu | SCAQC-1843-LC1 | SCAQC-1843-LD1 | SCAQC-1843-PB |
| Am | SCAQC-1843-LC1 | SCAQC-1843-LD1 | SCAQC-1843-PB |

PRELIMINARY INFORMATION

(800) Monticello Court • Montgomery, Alabama • 36117 • 334.272.2234 • FAX 334.213.0407

Sanford Cohen & Associates Southeastern Environmental Laboratory

Radioanalytical Results

Report Identification Number: 98A8967

| | | |
|-----------------------------------------|---------------------------------------------|-------------------------------|
| Project Name: <u>Kaiser-Hill</u> | Chain-of-Custody Number: <u>98A8967-002</u> | Metric: <u>Waste</u> |
| Site Sample ID: <u>002-002</u> | | |
| Other Sample ID: <u>T112A SW CORNER</u> | Collection Date: <u>7/21/99</u> | Date Received: <u>7/27/99</u> |
| | Batch Number: <u>1843</u> | Laboratory Code: <u>SCA</u> |

| Method Number | Radionuclide | Laboratory Sample ID | Activity (pCi/g) | 2 σ Counting Error (pCi/g) | Total Error (pCi/g) | MDA (pCi/g) |
|---------------|--------------|----------------------|------------------|-----------------------------------|---------------------|-------------|
| ACW03 | U-233/234 | KH199-1643-02 | 0.259 | 0.121 | 0.131 | 0.072 |
| ACW03 | U-235 | KH199-1643-02 | 0.000 | 0.000 | 0.000 | 0.043 |
| ACW03 | U-238 | KH199-1643-02 | 0.332 | 0.134 | 0.149 | 0.035 |
| ACW03 | PU-239/240 | KH199-1643-02 | 0.017 | 0.034 | 0.034 | 0.045 |
| ACW03 | AM-241 | KH199-1643-02 | 0.000 | 0.000 | 0.000 | 0.053 |

| Quality Control Samples | | | |
|-------------------------|--------------------------------|------------------------------------|------------------------|
| Radionuclide | Laboratory Control Sample (LC) | Laboratory Duplicate Analysis (LD) | Preparation Blank (PB) |
| U | SCAQC-1643-LC1 | SCAQC-1643-LD1 | SCAQC-1643-PB |
| Pu | SCAQC-1643-LC1 | SCAQC-1643-LD1 | SCAQC-1643-PB |
| Am | SCAQC-1643-LC1 | SCAQC-1643-LD1 | SCAQC-1643-PB |

PRELIMINARY
INFORMATION

1000 Mendocino Court • Montgomery, Alabama • 36117 • 334 272-2234 FAX 334 272-0607

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

SWIPE COUNTER PERFORMANCE LOG

INSTRUMENT MODEL: (Circle One)

SAC-4 / BC-4 / LUDLUM 2929

Counter Serial No. 835

ALPHA ☒ BETA ☐

Calibration Due Date: 10-26-99

Start Date: 8-16-99

End Date: 8-22-99

Building: 549

Location: office

Source: SN 680141

D. P. M.: 24830

Certification Due Date: N/A

Shift A11: Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____
 (Print Name / Signature) _____

Shift D1: Gross Source cpm: 7060
 Time: 0600 Bkg. cpm: 0.1
 RCT Emp. # [redacted] Net Source cpm: 7060
 % Error: -13.8
 (Print Name / Signature) [redacted]

Shift P1: Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____
 (Print Name / Signature) _____

Shift M2: Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____
 (Print Name / Signature) _____

Shift D2: Gross Source cpm: 7108
 Time: 0600 Bkg. cpm: 0.0
 RCT Emp. # [redacted] Net Source cpm: 7108
 % Error: -13.3
 (Print Name / Signature) [redacted]

Shift P2: Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____
 (Print Name / Signature) _____

Shift M3: Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____
 (Print Name / Signature) _____

Shift D3: Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____
 (Print Name / Signature) _____

Shift P3: Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____
 (Print Name / Signature) _____

Shift A4: Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____
 (Print Name / Signature) _____

Shift D4: Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____
 (Print Name / Signature) _____

Shift P4: Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____
 (Print Name / Signature) _____

Shift M5: Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____
 (Print Name / Signature) _____

Shift D5: Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____
 (Print Name / Signature) _____

Shift P5: Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____
 (Print Name / Signature) _____

Shift M6: Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____
 (Print Name / Signature) _____

Shift D6: Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____
 (Print Name / Signature) _____

Shift P6: Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____
 (Print Name / Signature) _____

Shift M7: Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____
 (Print Name / Signature) _____

Shift D7: Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____
 (Print Name / Signature) _____

Shift P7: Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____
 (Print Name / Signature) _____

$$\% \text{ ERROR} = \frac{(\text{Net cpm} / E) - \text{Source dpm}}{\text{Source dpm}} \times 100$$

Source dpm

Net cpm = gross - background cpm

E = Efficiency = 0.33 for the SAC-4 and 0.25 for the BC-4

Approved by

LN Cooper

[redacted]

11-99

Emd. #

Date

Best Available Copy

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

SWIPE COUNTER PERFORMANCE LOG

INSTRUMENT MODEL: (Circle One)

ALPHA ☐ BETA ☐

SAC-4/BC-4/ LUDLUM 2929

Counter Serial No. 824Calibration Due Date: 10-13-99Start Date: 8-2-99End Date: 8-8-99Building: 549Location: officeSource: SN 680141D. P. M.: 24830Certification Due Date: N/A

| | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Shift M1 Time: <u>N/A</u> RCT Emp. # <u>N/A</u> Gross Source cpm: <u>N/A</u> Bkg. cpm: <u>N/A</u> Net Source cpm: <u>N/A</u> % Error: <u>N/A</u> (Print Name / Signature) | Shift P1 Time: <u>N/A</u> RCT Emp. # <u>N/A</u> Gross Source cpm: <u>N/A</u> Bkg. cpm: <u>N/A</u> Net Source cpm: <u>N/A</u> % Error: <u>N/A</u> (Print Name / Signature) |
| Shift D1 Time: <u>0600</u> RCT Emp. # <u>[redacted]</u> Gross Source cpm: <u>7604</u> Bkg. cpm: <u>0.2</u> Net Source cpm: <u>7604</u> % Error: <u>-7.2</u> (Print Name / Signature) <u>W. W. [redacted]</u> | Shift M5 Time: <u>N/A</u> RCT Emp. # <u>N/A</u> Gross Source cpm: <u>N/A</u> Bkg. cpm: <u>N/A</u> Net Source cpm: <u>N/A</u> % Error: <u>N/A</u> (Print Name / Signature) |
| Shift P1 Time: <u>N/A</u> RCT Emp. # <u>N/A</u> Gross Source cpm: <u>N/A</u> Bkg. cpm: <u>N/A</u> Net Source cpm: <u>N/A</u> % Error: <u>N/A</u> (Print Name / Signature) | Shift D5 Time: <u>N/A</u> RCT Emp. # <u>N/A</u> Gross Source cpm: <u>N/A</u> Bkg. cpm: <u>N/A</u> Net Source cpm: <u>N/A</u> % Error: <u>N/A</u> (Print Name / Signature) |
| Shift M2 Time: <u>N/A</u> RCT Emp. # <u>N/A</u> Gross Source cpm: <u>N/A</u> Bkg. cpm: <u>N/A</u> Net Source cpm: <u>N/A</u> % Error: <u>N/A</u> (Print Name / Signature) | Shift P5 Time: <u>N/A</u> RCT Emp. # <u>N/A</u> Gross Source cpm: <u>N/A</u> Bkg. cpm: <u>N/A</u> Net Source cpm: <u>N/A</u> % Error: <u>N/A</u> (Print Name / Signature) |
| Shift D2 Time: <u>0600</u> RCT Emp. # <u>[redacted]</u> Gross Source cpm: <u>7696</u> Bkg. cpm: <u>0.2</u> Net Source cpm: <u>7696</u> % Error: <u>-6.1</u> (Print Name / Signature) <u>W. W. [redacted]</u> | Shift M6 Time: <u>N/A</u> RCT Emp. # <u>N/A</u> Gross Source cpm: <u>N/A</u> Bkg. cpm: <u>N/A</u> Net Source cpm: <u>N/A</u> % Error: <u>N/A</u> (Print Name / Signature) |
| Shift P2 Time: <u>N/A</u> RCT Emp. # <u>N/A</u> Gross Source cpm: <u>N/A</u> Bkg. cpm: <u>N/A</u> Net Source cpm: <u>N/A</u> % Error: <u>N/A</u> (Print Name / Signature) | Shift D6 Time: <u>N/A</u> RCT Emp. # <u>N/A</u> Gross Source cpm: <u>N/A</u> Bkg. cpm: <u>N/A</u> Net Source cpm: <u>N/A</u> % Error: <u>N/A</u> (Print Name / Signature) |
| Shift M3 Time: <u>N/A</u> RCT Emp. # <u>N/A</u> Gross Source cpm: <u>N/A</u> Bkg. cpm: <u>N/A</u> Net Source cpm: <u>N/A</u> % Error: <u>N/A</u> (Print Name / Signature) | Shift P6 Time: <u>N/A</u> RCT Emp. # <u>N/A</u> Gross Source cpm: <u>N/A</u> Bkg. cpm: <u>N/A</u> Net Source cpm: <u>N/A</u> % Error: <u>N/A</u> (Print Name / Signature) |
| Shift D3 Time: <u>0600</u> RCT Emp. # <u>[redacted]</u> Gross Source cpm: <u>7512</u> Bkg. cpm: <u>0.2</u> Net Source cpm: <u>7512</u> % Error: <u>-8.3</u> (Print Name / Signature) <u>W. W. [redacted]</u> | Shift M7 Time: <u>N/A</u> RCT Emp. # <u>N/A</u> Gross Source cpm: <u>N/A</u> Bkg. cpm: <u>N/A</u> Net Source cpm: <u>N/A</u> % Error: <u>N/A</u> (Print Name / Signature) |
| Shift P3 Time: <u>N/A</u> RCT Emp. # <u>N/A</u> Gross Source cpm: <u>N/A</u> Bkg. cpm: <u>N/A</u> Net Source cpm: <u>N/A</u> % Error: <u>N/A</u> (Print Name / Signature) | Shift D7 Time: <u>N/A</u> RCT Emp. # <u>N/A</u> Gross Source cpm: <u>N/A</u> Bkg. cpm: <u>N/A</u> Net Source cpm: <u>N/A</u> % Error: <u>N/A</u> (Print Name / Signature) |
| Shift M4 Time: <u>N/A</u> RCT Emp. # <u>N/A</u> Gross Source cpm: <u>N/A</u> Bkg. cpm: <u>N/A</u> Net Source cpm: <u>N/A</u> % Error: <u>N/A</u> (Print Name / Signature) | Shift P7 Time: <u>N/A</u> RCT Emp. # <u>N/A</u> Gross Source cpm: <u>N/A</u> Bkg. cpm: <u>N/A</u> Net Source cpm: <u>N/A</u> % Error: <u>N/A</u> (Print Name / Signature) |
| Shift D4 Time: <u>0600</u> RCT Emp. # <u>[redacted]</u> Gross Source cpm: <u>7500</u> Bkg. cpm: <u>0.1</u> Net Source cpm: <u>7500</u> % Error: <u>-8.3</u> (Print Name / Signature) <u>W. W. [redacted]</u> | % ERROR = $\frac{(\text{Net cpm} / E) - \text{Source dpm}}{\text{Source dpm}} \times 100$ Net cpm = gross - background cpm |

E = Efficiency = 0.33 for the SAC-4 and 0.25 for the BC-4

Approved by

R. LoooperR. Loooper

Date

8-10-99
512839

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

SWIPE COUNTER PERFORMANCE LOG

ALPHA ☐BETA ☒

INSTRUMENT MODEL: (Circle One)

SAC-4 (BC-4) LUDLUM 2929

Counter Serial No. 82770Calibration Due Date: 1-7-00Start Date: 8-16-99End Date: 8-22-99Building: 549Location: officeSource: SN 603927D. P. M.: 22723Certification Due Date: N/A

Shift A11
Time: _____ Gross Source cpm: _____
Bg. cpm: _____
RCT Emp. # _____ Net Source cpm: _____
% Error: _____
(Print Name / Signature) _____

Shift P1
Time: _____ Gross Source cpm: _____
Bg. cpm: _____
RCT Emp. # _____ Net Source cpm: _____
% Error: _____
(Print Name / Signature) _____

Shift D1
Time: 06:00 Gross Source cpm: 5112
Bg. cpm: 38
RCT Emp. # [redacted] Net Source cpm: 5074
% Error: -10.7
(Print Name / Signature) [redacted]

Shift M5
Time: _____ Gross Source cpm: _____
Bg. cpm: _____
RCT Emp. # _____ Net Source cpm: _____
% Error: _____
(Print Name / Signature) _____

Shift P1
Time: _____ Gross Source cpm: _____
Bg. cpm: _____
RCT Emp. # _____ Net Source cpm: _____
% Error: _____
(Print Name / Signature) _____

Shift D5
Time: _____ Gross Source cpm: _____
Bg. cpm: _____
RCT Emp. # _____ Net Source cpm: _____
% Error: _____
(Print Name / Signature) _____

Shift M2
Time: _____ Gross Source cpm: _____
Bg. cpm: _____
RCT Emp. # _____ Net Source cpm: _____
% Error: _____
(Print Name / Signature) _____

Shift P5
Time: _____ Gross Source cpm: _____
Bg. cpm: _____
RCT Emp. # _____ Net Source cpm: _____
% Error: _____
(Print Name / Signature) _____

Shift D2
Time: 06:00 Gross Source cpm: 5131
Bg. cpm: 37
RCT Emp. # [redacted] Net Source cpm: 5154
% Error: -9.3
(Print Name / Signature) [redacted]

Shift M6
Time: _____ Gross Source cpm: _____
Bg. cpm: _____
RCT Emp. # _____ Net Source cpm: _____
% Error: _____
(Print Name / Signature) _____

Shift P2
Time: _____ Gross Source cpm: _____
Bg. cpm: _____
RCT Emp. # _____ Net Source cpm: _____
% Error: _____
(Print Name / Signature) _____

Shift D6
Time: _____ Gross Source cpm: _____
Bg. cpm: _____
RCT Emp. # _____ Net Source cpm: _____
% Error: _____
(Print Name / Signature) _____

Shift M3
Time: _____ Gross Source cpm: _____
Bg. cpm: _____
RCT Emp. # _____ Net Source cpm: _____
% Error: _____
(Print Name / Signature) _____

Shift P6
Time: _____ Gross Source cpm: _____
Bg. cpm: _____
RCT Emp. # _____ Net Source cpm: _____
% Error: _____
(Print Name / Signature) _____

Shift D3
Time: _____ Gross Source cpm: _____
Bg. cpm: _____
RCT Emp. # _____ Net Source cpm: _____
% Error: _____
(Print Name / Signature) _____

Shift M7
Time: _____ Gross Source cpm: _____
Bg. cpm: _____
RCT Emp. # _____ Net Source cpm: _____
% Error: _____
(Print Name / Signature) _____

Shift P3
Time: _____ Gross Source cpm: _____
Bg. cpm: _____
RCT Emp. # _____ Net Source cpm: _____
% Error: _____
(Print Name / Signature) _____

Shift D7
Time: _____ Gross Source cpm: _____
Bg. cpm: _____
RCT Emp. # _____ Net Source cpm: _____
% Error: _____
(Print Name / Signature) _____

Shift A11
Time: _____ Gross Source cpm: _____
Bg. cpm: _____
RCT Emp. # _____ Net Source cpm: _____
% Error: _____
(Print Name / Signature) _____

Shift P7
Time: _____ Gross Source cpm: _____
Bg. cpm: _____
RCT Emp. # _____ Net Source cpm: _____
% Error: _____
(Print Name / Signature) _____

Shift D4
Time: _____ Gross Source cpm: _____
Bg. cpm: _____
RCT Emp. # _____ Net Source cpm: _____
% Error: _____
(Print Name / Signature) _____

Shift P7
Time: _____ Gross Source cpm: _____
Bg. cpm: _____
RCT Emp. # _____ Net Source cpm: _____
% Error: _____
(Print Name / Signature) _____

$$\% \text{ ERROR} = \frac{(\text{Net cpm}/E) - \text{Source dpm}}{\text{Source dpm}} \times 100$$

$$\text{Net cpm} = \text{gross} - \text{background cpm}$$

E = Efficiency = 0.33 for the SAC-4 and 0.25 for the BC-4

Approved by

LN Cooper[Signature]

EMO. #

Date

8-17-99

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

SWIPE COUNTER PERFORMANCE LOG

INSTRUMENT MODEL: (Circle One)

ALPHA ☐BETA ☒

SAC-4 / BC-4 LUDLUM 2929

Counter Serial No.

81700

Calibration Due Date: 10-22-99

Start Date: 8-16-99

End Date: 8-22-99

Building: 544

Location: 044e

Source: SN 603927

D. P. M.: 22723

Certification Due Date: 11/1A

Shift M1 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____

(Print Name / Signature)

Shift D1 Gross Source cpm: 5282
 Time: 0600 Bkg. cpm: 41
 RCT Emp. # _____ Net Source cpm: 5241
 % Error: -7.7

(Print Name / Signature)

Shift P1 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____

(Print Name / Signature)

Shift M2 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____

(Print Name / Signature)

Shift D2 Gross Source cpm: 5262
 Time: 0600 Bkg. cpm: 39
 RCT Emp. # _____ Net Source cpm: 5223
 % Error: -8.1

(Print Name / Signature)

Shift P2 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____

(Print Name / Signature)

Shift M3 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____

(Print Name / Signature)

Shift D3 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____

(Print Name / Signature)

Shift P3 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____

(Print Name / Signature)

Shift M4 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____

(Print Name / Signature)

Shift D4 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____

(Print Name / Signature)

Shift P4 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____

(Print Name / Signature)

Shift M5 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____

(Print Name / Signature)

Shift D5 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____

(Print Name / Signature)

Shift P5 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____

(Print Name / Signature)

Shift M6 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____

(Print Name / Signature)

Shift D6 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____

(Print Name / Signature)

Shift P6 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____

(Print Name / Signature)

Shift M7 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____

(Print Name / Signature)

Shift D7 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____

(Print Name / Signature)

Shift P7 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____

(Print Name / Signature)

% ERROR = $\frac{(\text{Net cpm}/E) - \text{Source dpm}}{\text{Source dpm}} \times 100$

Net cpm = gross - background cpm

E = Efficiency = 0.33 for the SAC-4 and 0.35 for the BC-4

Approved by

W Cooper

K Cooper

Emd. #

Date

8-17-99

Electra Performance Test Log

| | | | | |
|-----------------------------------------|----------------------|------------------------------------------------------------|--------------------|------------------------------|
| Instrument Serial Number <u>1681</u> | | Instrument Efficiency Alpha <u>21.0%</u> Beta <u>32.4%</u> | | |
| | | Instrument Calibration Due Date <u>11-11-99</u> | | |
| Source Serial Number | Calibration Due Date | Source Act. (dpm) | Source Acct. (cpm) | Source Acceptable Range (sq) |
| <u>680141</u> | <u>WLA</u> | <u>24830</u> | <u>5214</u> | <u>4171 to 6257</u> |
| <u>603927</u> | <u>NLA</u> | <u>22770</u> | <u>7311</u> | <u>5702 to 8853</u> |
| <u>603927</u> | <u>WLA</u> | <u>22723</u> | <u>7362</u> | <u>5890 to 8835</u> |
| | | | | |
| | | | | |
| | | | | |

| Date | ALPHA BKGD3 | ALPHA Reading (Corrected cpm)3 | ALPHA Pass/Fail | BETA Bkgd 3 | BETA Reading (Corrected cpm)3 | BETA Pass/Fail | RCT Employee Number | RCT NAME (Print) | RCT Signature |
|---------|-------------|--------------------------------|-----------------|-------------|-------------------------------|----------------|---------------------|------------------|---------------|
| 7/26/99 | 7 | 5000 | PASS | 457 | 6811 | PASS | | M. W. Woz | |
| 7/27/99 | 1 | 4940 | PASS | 497 | 6927 | PASS | | M. W. Woz | |
| 7/28/99 | 4 | 4960 | PASS | 534 | 6704 | PASS | | M. W. Woz | |
| 7/29/99 | 5 | 5020 | PASS | 474 | 6865 | PASS | | M. W. Woz | |
| 7/30/99 | 2 | 4940 | PASS | 515 | 6970 | PASS | | M. W. Woz | |
| 8/12/99 | 4 | 5020 | PASS | 572 | 6886 | PASS | | M. W. Woz | |
| 8/13/99 | 3 | 4870 | PASS | 501 | 6972 | PASS | | M. W. Woz | |
| 8/14/99 | 4 | 4860 | PASS | 501 | 6966 | PASS | | M. W. Woz | |
| 8/15/99 | 2 | 5000 | PASS | 504 | 6831 | PASS | | M. W. Woz | |
| 8/19/99 | 3 | 4950 | PASS | 522 | 6388 | PASS | | G. HASENKAMP | |
| 8/10/99 | 2 | 4940 | PASS | 573 | 6520 | PASS | | G. HASENKAMP | |
| 8/13/99 | 2 | 4800 | PASS | 634 | 6933 | PASS | | G. HASENKAMP | |
| 8/16/99 | 5 | 5120 | PASS | 484 | 6891 | PASS | | M. W. Woz | |

1. Source activity in cpm is equal to the source activity in dpm multiplied by the efficiency.

REVIEWED BY:

2. Acceptable range is a + 20% (source activity in cpm multiplied by 0.8 or 1.2).

3. All counts are to be 1 minute in duration.

NOTE: If the instrument will be used for alpha measurements only, the beta portion of the test log should be lined through. If the instrument will be used for beta, then the alpha portion should be lined through.

LN Cooper
RO SUPERVISOR PRINT NAME

RO SUPERVISOR SIGNATURE

18-17-99
DATE

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

SWIPE COUNTER PERFORMANCE LOG

INSTRUMENT MODEL: (Circle One)

ALPHA ☐BETA ☒

SAC-4 (BC-4) MUDDUM 2929

Counter Serial No.: R-770

Calibration Due Date: 1-7-00

Start Date: 8-16-99

End Date: 8-22-99

Building: 549

Location: office

Source: SM 60392-7

D. P. M.: 22723

Certification Due Date: N/A

Shift A1
Time: _____
RCT Emp. # _____
Gross Source cpm: _____
Bkg. cpm: _____
Net Source cpm: _____
% Error: _____

(Print Name / Signature)

Shift P1
Time: _____
RCT Emp. # _____
Gross Source cpm: _____
Bkg. cpm: _____
Net Source cpm: _____
% Error: _____

(Print Name / Signature)

Shift D1
Time: 0600
RCT Emp. # [redacted]
Gross Source cpm: 5112
Bkg. cpm: 38
Net Source cpm: 5074
% Error: -10.7

(Print Name / Signature)

Shift M5
Time: _____
RCT Emp. # _____
Gross Source cpm: _____
Bkg. cpm: _____
Net Source cpm: _____
% Error: _____

(Print Name / Signature)

Shift P1
Time: _____
RCT Emp. # _____
Gross Source cpm: _____
Bkg. cpm: 117
Net Source cpm: _____
% Error: _____

(Print Name / Signature)

Shift D5
Time: MAX NO 302 888 200
RCT Emp. # _____
Gross Source cpm: _____
Bkg. cpm: _____
Net Source cpm: _____
% Error: _____

(Print Name / Signature)

Shift M2
Time: _____
RCT Emp. # _____
Gross Source cpm: _____
Bkg. cpm: _____
Net Source cpm: _____
% Error: _____

(Print Name / Signature)

Shift P5
Time: _____
RCT Emp. # _____
Gross Source cpm: _____
Bkg. cpm: _____
Net Source cpm: _____
% Error: _____

(Print Name / Signature)

Shift D2
Time: 0600
RCT Emp. # [redacted]
Gross Source cpm: 5197
Bkg. cpm: 37
Net Source cpm: 5160
% Error: -9.3

(Print Name / Signature)

Shift M6
Time: _____
RCT Emp. # _____
Gross Source cpm: _____
Bkg. cpm: _____
Net Source cpm: _____
% Error: _____

(Print Name / Signature)

Shift P2
Time: _____
RCT Emp. # _____
Gross Source cpm: _____
Bkg. cpm: _____
Net Source cpm: _____
% Error: _____

(Print Name / Signature)

Shift D6
Time: _____
RCT Emp. # _____
Gross Source cpm: _____
Bkg. cpm: _____
Net Source cpm: _____
% Error: _____

(Print Name / Signature)

Shift M3
Time: _____
RCT Emp. # _____
Gross Source cpm: _____
Bkg. cpm: _____
Net Source cpm: _____
% Error: _____

(Print Name / Signature)

Shift P6
Time: _____
RCT Emp. # _____
Gross Source cpm: _____
Bkg. cpm: _____
Net Source cpm: _____
% Error: _____

(Print Name / Signature)

Shift D3
Time: 0600
RCT Emp. # [redacted]
Gross Source cpm: 5058
Bkg. cpm: 37
Net Source cpm: 5021
% Error: -11.6

(Print Name / Signature)

Shift M7
Time: _____
RCT Emp. # _____
Gross Source cpm: _____
Bkg. cpm: _____
Net Source cpm: _____
% Error: _____

(Print Name / Signature)

Shift P3
Time: _____
RCT Emp. # _____
Gross Source cpm: _____
Bkg. cpm: _____
Net Source cpm: _____
% Error: _____

(Print Name / Signature)

Shift D7
Time: _____
RCT Emp. # _____
Gross Source cpm: _____
Bkg. cpm: _____
Net Source cpm: _____
% Error: _____

(Print Name / Signature)

Shift A1
Time: _____
RCT Emp. # _____
Gross Source cpm: _____
Bkg. cpm: _____
Net Source cpm: _____
% Error: _____

(Print Name / Signature)

Shift P7
Time: _____
RCT Emp. # _____
Gross Source cpm: _____
Bkg. cpm: _____
Net Source cpm: _____
% Error: _____

(Print Name / Signature)

Shift D4
Time: 0600
RCT Emp. # [redacted]
Gross Source cpm: 5204
Bkg. cpm: 37
Net Source cpm: 5167
% Error: -9.0

(Print Name / Signature)

% ERROR = $\frac{(\text{Net cpm} / E) - \text{Source dpm}}{\text{Source dpm}} \times 100$

Source dpm

Net cpm = gross - background cpm

E = Efficiency = 0.33 for the SAC-4 and 0.25 for the BC-4

Approved by

L. N. Cooper

L. Cooper

18/9-99

Emp. # _____ Date

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

SWIPE COUNTER PERFORMANCE LOG

INSTRUMENT MODEL: (Circle One) SAC 4 / BC 4 LUOLUM 2929 Counter Serial No. 86700 ALPHA ☐ BETA ☒
Start Date: 8-16-99 End Date: 8-22-99 Building: 549 Calibration Due Date: 10-22-99
Source: SN 603927 D. P. M.: 22723 Location: Office Certification Due Date: N/A

| Shift | Time | Gross Source cpm | Bkg. cpm | Net Source cpm | % Error | Shift | Time | Gross Source cpm | Bkg. cpm | Net Source cpm | % Error |
|--------------------------|-------------|------------------|-----------|----------------|------------|--------------------------------------------------------------------------------------------------------------------------------------------|------------|------------------|------------|----------------|---------|
| Shift M1 | | | | | | Shift P1 | | | | | |
| Time: | | | | | | Time: | | | | | |
| RCT Emp. # | | | | | | RCT Emp. # | | | | | |
| (Print Name / Signature) | | | | | | (Print Name / Signature) | | | | | |
| Shift D1 | <u>0600</u> | <u>5282</u> | <u>41</u> | <u>5241</u> | <u>7.7</u> | Shift MS | | | | | |
| Time: | | | | | | Time: | | | | | |
| RCT Emp. # | | | | | | RCT Emp. # | | | | | |
| (Print Name / Signature) | | | | | | (Print Name / Signature) | | | | | |
| Shift P1 | | | | | | Shift DS | <u>549</u> | <u>303</u> | <u>966</u> | <u>20</u> | |
| Time: | | | | | | Time: | | | | | |
| RCT Emp. # | | | | | | RCT Emp. # | | | | | |
| (Print Name / Signature) | | | | | | (Print Name / Signature) | | | | | |
| Shift M2 | | | | | | Shift JS | | | | | |
| Time: | | | | | | Time: | | | | | |
| RCT Emp. # | | | | | | RCT Emp. # | | | | | |
| (Print Name / Signature) | | | | | | (Print Name / Signature) | | | | | |
| Shift D2 | <u>0600</u> | <u>5262</u> | <u>39</u> | <u>5223</u> | <u>8.1</u> | Shift M6 | | | | | |
| Time: | | | | | | Time: | | | | | |
| RCT Emp. # | | | | | | RCT Emp. # | | | | | |
| (Print Name / Signature) | | | | | | (Print Name / Signature) | | | | | |
| Shift P2 | | | | | | Shift D6 | | | | | |
| Time: | | | | | | Time: | | | | | |
| RCT Emp. # | | | | | | RCT Emp. # | | | | | |
| (Print Name / Signature) | | | | | | (Print Name / Signature) | | | | | |
| Shift M3 | | | | | | Shift P6 | | | | | |
| Time: | | | | | | Time: | | | | | |
| RCT Emp. # | | | | | | RCT Emp. # | | | | | |
| (Print Name / Signature) | | | | | | (Print Name / Signature) | | | | | |
| Shift D3 | <u>0600</u> | <u>5237</u> | <u>41</u> | <u>5196</u> | <u>8.5</u> | Shift M7 | | | | | |
| Time: | | | | | | Time: | | | | | |
| RCT Emp. # | | | | | | RCT Emp. # | | | | | |
| (Print Name / Signature) | | | | | | (Print Name / Signature) | | | | | |
| Shift P3 | | | | | | Shift D7 | | | | | |
| Time: | | | | | | Time: | | | | | |
| RCT Emp. # | | | | | | RCT Emp. # | | | | | |
| (Print Name / Signature) | | | | | | (Print Name / Signature) | | | | | |
| Shift A1 | | | | | | Shift P7 | | | | | |
| Time: | | | | | | Time: | | | | | |
| RCT Emp. # | | | | | | RCT Emp. # | | | | | |
| (Print Name / Signature) | | | | | | (Print Name / Signature) | | | | | |
| Shift D4 | <u>0600</u> | <u>5755</u> | <u>10</u> | <u>5745</u> | <u>8.2</u> | $\% \text{ ERROR} = \frac{(\text{Net cpm} / E) - \text{Source dpm}}{\text{Source dpm}} \times 100$ <p>Net cpm = gross - background cpm</p> | | | | | |
| Time: | | | | | | | | | | | |
| RCT Emp. # | | | | | | | | | | | |
| (Print Name / Signature) | | | | | | | | | | | |

E = Efficiency = 0.33 for the SAC and 0.35 for the BC4

COPY

Approved by: CN Cooper Signature: Shloop Emp. # 8-19-99 Date

RS FORMS 02.01-03

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

SWIPE COUNTER PERFORMANCE LOG

INSTRUMENT MODEL: (Circle One)

SAC-4/BC-4/LUDLUM 2929

Counter Serial No. 824

ALPHA ☐ BETA ☒

Calibration Due Date: 10-13-99

Start Date: 8-16-99

End Date: 8-22-99

Building: 549

Location: office

Source: SIN 680141

D. P. M.: 24830

Certification Due Date: N/A

Shift M1 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____

(Print Name / Signature)

Shift D1 Gross Source cpm: 7479
 Time: 0600 Bkg. cpm: 0.0
 RCT Emp. # [redacted] Net Source cpm: 7479
 % Error: -8.7

(Print Name / Signature)

Shift P1 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____

(Print Name / Signature)

Shift M2 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____

(Print Name / Signature)

Shift D2 Gross Source cpm: 7293
 Time: 0600 Bkg. cpm: 0.1
 RCT Emp. # [redacted] Net Source cpm: 7293
 % Error: -11.0

(Print Name / Signature)

Shift P2 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____

(Print Name / Signature)

Shift M3 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____

(Print Name / Signature)

Shift D3 Gross Source cpm: 7497
 Time: 0600 Bkg. cpm: 0.2
 RCT Emp. # [redacted] Net Source cpm: 7497
 % Error: -8.5

(Print Name / Signature)

Shift P3 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____

(Print Name / Signature)

Shift M4 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____

(Print Name / Signature)

Shift D4 Gross Source cpm: 7576
 Time: 0600 Bkg. cpm: 0.2
 RCT Emp. # [redacted] Net Source cpm: 7576
 % Error: -7.6

(Print Name / Signature)

Shift P4 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____

(Print Name / Signature)

Shift M5 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____

(Print Name / Signature)

Shift D5 Gross Source cpm: _____
 Time: MAY MO 303 000 Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____

(Print Name / Signature)

Shift P5 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____

(Print Name / Signature)

Shift M6 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____

(Print Name / Signature)

Shift D6 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____

(Print Name / Signature)

Shift P6 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____

(Print Name / Signature)

Shift M7 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____

(Print Name / Signature)

Shift D7 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____

(Print Name / Signature)

Shift P7 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____

(Print Name / Signature)

$$\% \text{ ERROR} = \frac{(\text{Net cpm} / E) - \text{Source dpm}}{\text{Source dpm}} \times 100$$

Source dpm
 Net cpm = gross - background cpm

E = Efficiency 0.33 for the SAC and 0.25 for the BC-4

Approved by

UNCooper

Signature

8-19-99

Date

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

SWIPE COUNTER PERFORMANCE LOG

INSTRUMENT MODEL: (Circle One) SAC-4 BC-4 / LUDLUM 2929 Counter Serial No. 835 ALPHA ☒ BETA ☐
 Start Date: 8-16-99 End Date: 8-22-99 Building: 549 Calibration Due Date: 10-26-99
 Source: SN 680141 D. P. M.: 24830 Location: office Certification Due Date: N/A

| | | | |
|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| Shift M1 Time: _____ RCT Emp. # _____ (Print Name / Signature) _____ | Gross Source cpm: _____ Bkg. cpm: _____ Net Source cpm: _____ % Error: _____ | Shift P4 Time: _____ RCT Emp. # _____ (Print Name / Signature) _____ | Gross Source cpm: _____ Bkg. cpm: _____ Net Source cpm: _____ % Error: _____ |
| Shift O1 Time: <u>0600</u> RCT Emp. # _____ (Print Name / Signature) _____ | Gross Source cpm: <u>7060</u> Bkg. cpm: <u>0.1</u> Net Source cpm: <u>7060</u> % Error: <u>-13.8</u> | Shift M5 Time: _____ RCT Emp. # _____ (Print Name / Signature) _____ | Gross Source cpm: _____ Bkg. cpm: _____ Net Source cpm: _____ % Error: _____ |
| Shift P1 Time: _____ RCT Emp. # _____ (Print Name / Signature) _____ | Gross Source cpm: _____ Bkg. cpm: _____ Net Source cpm: _____ % Error: _____ | Shift B5 Time: <u>FAX NO 303 968 2086</u> RCT Emp. # _____ (Print Name / Signature) _____ | Gross Source cpm: _____ Bkg. cpm: _____ Net Source cpm: _____ % Error: _____ |
| Shift M2 Time: _____ RCT Emp. # _____ (Print Name / Signature) _____ | Gross Source cpm: _____ Bkg. cpm: _____ Net Source cpm: _____ % Error: _____ | Shift P5 Time: _____ RCT Emp. # _____ (Print Name / Signature) _____ | Gross Source cpm: _____ Bkg. cpm: _____ Net Source cpm: _____ % Error: _____ |
| Shift O2 Time: <u>0600</u> RCT Emp. # _____ (Print Name / Signature) _____ | Gross Source cpm: <u>7108</u> Bkg. cpm: <u>0.9</u> Net Source cpm: <u>7108</u> % Error: <u>-13.3</u> | Shift M6 Time: _____ RCT Emp. # _____ (Print Name / Signature) _____ | Gross Source cpm: _____ Bkg. cpm: _____ Net Source cpm: _____ % Error: _____ |
| Shift P2 Time: _____ RCT Emp. # _____ (Print Name / Signature) _____ | Gross Source cpm: _____ Bkg. cpm: _____ Net Source cpm: _____ % Error: _____ | Shift O6 Time: _____ RCT Emp. # _____ (Print Name / Signature) _____ | Gross Source cpm: _____ Bkg. cpm: _____ Net Source cpm: _____ % Error: _____ |
| Shift M3 Time: _____ RCT Emp. # _____ (Print Name / Signature) _____ | Gross Source cpm: _____ Bkg. cpm: _____ Net Source cpm: _____ % Error: _____ | Shift P6 Time: _____ RCT Emp. # _____ (Print Name / Signature) _____ | Gross Source cpm: _____ Bkg. cpm: _____ Net Source cpm: _____ % Error: _____ |
| Shift O3 Time: <u>0600</u> RCT Emp. # _____ (Print Name / Signature) _____ | Gross Source cpm: <u>7254</u> Bkg. cpm: <u>0.2</u> Net Source cpm: <u>7254</u> % Error: <u>-11.5</u> | Shift M7 Time: _____ RCT Emp. # _____ (Print Name / Signature) _____ | Gross Source cpm: _____ Bkg. cpm: _____ Net Source cpm: _____ % Error: _____ |
| Shift P3 Time: _____ RCT Emp. # _____ (Print Name / Signature) _____ | Gross Source cpm: _____ Bkg. cpm: _____ Net Source cpm: _____ % Error: _____ | Shift O7 Time: _____ RCT Emp. # _____ (Print Name / Signature) _____ | Gross Source cpm: _____ Bkg. cpm: _____ Net Source cpm: _____ % Error: _____ |
| Shift M4 Time: _____ RCT Emp. # _____ (Print Name / Signature) _____ | Gross Source cpm: _____ Bkg. cpm: _____ Net Source cpm: _____ % Error: _____ | Shift P7 Time: _____ RCT Emp. # _____ (Print Name / Signature) _____ | Gross Source cpm: _____ Bkg. cpm: _____ Net Source cpm: _____ % Error: _____ |
| Shift O4 Time: <u>0600</u> RCT Emp. # _____ (Print Name / Signature) _____ | Gross Source cpm: <u>6973</u> Bkg. cpm: <u>0.1</u> Net Source cpm: <u>6973</u> % Error: <u>-14.9</u> | $\% \text{ ERROR} = \frac{(\text{Net cpm} / E) - \text{Source dpm}}{\text{Source dpm}} \times 100$ <p>Net cpm = gross - background cpm</p> | |

E = Efficiency = 0.33 for the SAC-4 and 0.35 for the BC-4

Approved by

C N Cooper

C N Cooper

8-29-99

Date

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

SWIPE-COUNTER PERFORMANCE LOG

INSTRUMENT MODEL: (Circle One)

SAC-4/BC-4/UDLUM 2929

Counter Serial No.: R2 770

ALPHA ☐BETA ☒

Calibration Due Date: 1-7-00

Start Date: 8-16-99

End Date: 8-22-99

Building: 549

Location: office

Source: SM 603927

D. P. M.: 22723

Certification Due Date: N/A

Shift M1

Gross Source cpm:

Time:

Bkg. cpm:

RCT Emp. #

Net Source cpm:

% Error:

(Print Name / Signature)

Shift D1

Gross Source cpm:

Time:

Bkg. cpm:

RCT Emp. #

Net Source cpm:

% Error:

(Print Name / Signature)

Shift P1

Gross Source cpm:

Time:

Bkg. cpm:

RCT Emp. #

Net Source cpm:

% Error:

(Print Name / Signature)

Shift M2

Gross Source cpm:

Time:

Bkg. cpm:

RCT Emp. #

Net Source cpm:

% Error:

(Print Name / Signature)

Shift D2

Gross Source cpm:

Time:

Bkg. cpm:

RCT Emp. #

Net Source cpm:

% Error:

(Print Name / Signature)

Shift P2

Gross Source cpm:

Time:

Bkg. cpm:

RCT Emp. #

Net Source cpm:

% Error:

(Print Name / Signature)

Shift M3

Gross Source cpm:

Time:

Bkg. cpm:

RCT Emp. #

Net Source cpm:

% Error:

(Print Name / Signature)

Shift D3

Gross Source cpm:

Time:

Bkg. cpm:

RCT Emp. #

Net Source cpm:

% Error:

(Print Name / Signature)

Shift P3

Gross Source cpm:

Time:

Bkg. cpm:

RCT Emp. #

Net Source cpm:

% Error:

(Print Name / Signature)

Shift M4

Gross Source cpm:

Time:

Bkg. cpm:

RCT Emp. #

Net Source cpm:

% Error:

(Print Name / Signature)

Shift D4

Gross Source cpm:

Time:

Bkg. cpm:

RCT Emp. #

Net Source cpm:

% Error:

(Print Name / Signature)

Shift P4

Gross Source cpm:

Time:

Bkg. cpm:

RCT Emp. #

Net Source cpm:

% Error:

(Print Name / Signature)

Shift P4

Gross Source cpm:

Time:

Bkg. cpm:

RCT Emp. #

Net Source cpm:

% Error:

(Print Name / Signature)

Shift M5

Gross Source cpm:

Time:

Bkg. cpm:

RCT Emp. #

Net Source cpm:

% Error:

(Print Name / Signature)

Shift D5

Gross Source cpm:

Time:

Bkg. cpm:

RCT Emp. #

Net Source cpm:

% Error:

(Print Name / Signature)

Shift P5

Gross Source cpm:

Time:

Bkg. cpm:

RCT Emp. #

Net Source cpm:

% Error:

(Print Name / Signature)

Shift M6

Gross Source cpm:

Time:

Bkg. cpm:

RCT Emp. #

Net Source cpm:

% Error:

(Print Name / Signature)

Shift D6

Gross Source cpm:

Time:

Bkg. cpm:

RCT Emp. #

Net Source cpm:

% Error:

(Print Name / Signature)

Shift P6

Gross Source cpm:

Time:

Bkg. cpm:

RCT Emp. #

Net Source cpm:

% Error:

(Print Name / Signature)

Shift M7

Gross Source cpm:

Time:

Bkg. cpm:

RCT Emp. #

Net Source cpm:

% Error:

(Print Name / Signature)

Shift D7

Gross Source cpm:

Time:

Bkg. cpm:

RCT Emp. #

Net Source cpm:

% Error:

(Print Name / Signature)

Shift P7

Gross Source cpm:

Time:

Bkg. cpm:

RCT Emp. #

Net Source cpm:

% Error:

(Print Name / Signature)

% ERROR = (Net cpm/E) - Source dpm x 100

Source dpm

Net cpm = gross - background cpm

E = Efficiency 0.53 for the SAC-4 and 0.25 for the BC-4

Approved by

LN Cooper

L. Cooper

Emp. #

Date

8/19-99

ROCKY MOUNTAIN ENVIRONMENTAL TECHNOLOGY SITE

SWIPE COUNTER PERFORMANCE LOG

INSTRUMENT MODEL: (Circle One)

SAC 4 / BC 4 / LUDLUM 2929

Counter Serial No. Bc 700ALPHA ☐BETA ☒Calibration Due Date: 10-22-99Start Date: 8-16-99End Date: 8-22-99Building: 549Location: 6124Source: S/N 603927D. P. M.: 22723Certification Due Date: N/A

Shift M1 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 _____ % Error: _____
 (Print Name / Signature) _____

Shift D1 Gross Source cpm: 5282
 Time: 0600 Bkg. cpm: 47
 RCT Emp. # [redacted] Net Source cpm: 5241
[Signature] % Error: -7.7
 (Print Name / Signature) _____

Shift P1 Gross Source cpm: _____
 Time: _____ Bkg. cpm: IV
 RCT Emp. # _____ Net Source cpm: _____
 _____ % Error: _____
 (Print Name / Signature) _____

Shift M2 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 _____ % Error: _____
 (Print Name / Signature) _____

Shift D2 Gross Source cpm: 5262
 Time: 0600 Bkg. cpm: 39
 RCT Emp. # [redacted] Net Source cpm: 5223
[Signature] % Error: -8.1
 (Print Name / Signature) _____

Shift P2 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 _____ % Error: _____
 (Print Name / Signature) _____

Shift M3 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 _____ % Error: _____
 (Print Name / Signature) _____

Shift D3 Gross Source cpm: 5237
 Time: 0600 Bkg. cpm: 41
 RCT Emp. # [redacted] Net Source cpm: 5196
[Signature] % Error: -8.5
 (Print Name / Signature) _____

Shift P3 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 _____ % Error: _____
 (Print Name / Signature) _____

Shift M4 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 _____ % Error: _____
 (Print Name / Signature) _____

Shift D4 Gross Source cpm: 5753
 Time: 0600 Bkg. cpm: 10
 RCT Emp. # [redacted] Net Source cpm: 5243
[Signature] % Error: -8.2
 (Print Name / Signature) _____

E = Efficiency = 0.33 for the SAC and 0.35 for the BC-4

Shift P4 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 _____ % Error: _____
 (Print Name / Signature) _____

Shift M5 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 _____ % Error: _____
 (Print Name / Signature) _____

Shift D5 Gross Source cpm: _____
 Time: FAX NO 303 966 2002 Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 _____ % Error: _____
 (Print Name / Signature) _____

Shift P5 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 _____ % Error: _____
 (Print Name / Signature) _____

Shift M6 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 _____ % Error: _____
 (Print Name / Signature) _____

Shift D6 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 _____ % Error: _____
 (Print Name / Signature) _____

Shift P6 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 _____ % Error: _____
 (Print Name / Signature) _____

Shift M7 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 _____ % Error: _____
 (Print Name / Signature) _____

Shift D7 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 _____ % Error: _____
 (Print Name / Signature) _____

Shift P7 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 _____ % Error: _____
 (Print Name / Signature) _____

$$\% \text{ ERROR} = \frac{(\text{Net cpm} / E) - \text{Source dpm}}{\text{Source dpm}} \times 100$$

Source dpm
 Net cpm = gross - background cpm

Approved by

C N Cooper[Signature]

Emp. # _____ Date

8-19-99

ROCKY MOUNTAIN ENVIRONMENTAL TECHNOLOGY SITE

SWIPE COUNTER PERFORMANCE LOG

INSTRUMENT MODEL: (Circle One) SAC-4/BC-4/LUDLUM 2929 Counter Serial No.: 824 ALPHA ☒ BETA ☐
 Start Date: 8-16-99 End Date: 8-22-99 Building: 549 Calibration Due Date: 10-13-99
 Source: SIN 680141 D. P. M.: 24830 Location: OFFICE Certification Due Date: WLA

| | | | |
|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| Shift M1 Time: _____ RCT Emp. # _____ (Print Name / Signature) _____ | Gross Source cpm: _____ Bkg. cpm: _____ Net Source cpm: _____ % Error: _____ | Shift P1 Time: _____ RCT Emp. # _____ (Print Name / Signature) _____ | Gross Source cpm: _____ Bkg. cpm: _____ Net Source cpm: _____ % Error: _____ |
| Shift O1 Time: <u>0600</u> RCT Emp. # _____ (Print Name / Signature) _____ | Gross Source cpm: <u>7479</u> Bkg. cpm: <u>0.0</u> Net Source cpm: <u>7479</u> % Error: <u>-8.7</u> | Shift M5 Time: _____ RCT Emp. # _____ (Print Name / Signature) _____ | Gross Source cpm: _____ Bkg. cpm: _____ Net Source cpm: _____ % Error: _____ |
| Shift P1 Time: _____ RCT Emp. # _____ (Print Name / Signature) _____ | Gross Source cpm: _____ Bkg. cpm: _____ Net Source cpm: _____ % Error: _____ | Shift D5 Time: <u>04X NO 303 000 200</u> RCT Emp. # _____ (Print Name / Signature) _____ | Gross Source cpm: _____ Bkg. cpm: _____ Net Source cpm: _____ % Error: _____ |
| Shift M2 Time: _____ RCT Emp. # _____ (Print Name / Signature) _____ | Gross Source cpm: _____ Bkg. cpm: _____ Net Source cpm: _____ % Error: _____ | Shift P5 Time: _____ RCT Emp. # _____ (Print Name / Signature) _____ | Gross Source cpm: _____ Bkg. cpm: _____ Net Source cpm: _____ % Error: _____ |
| Shift O2 Time: <u>0600</u> RCT Emp. # _____ (Print Name / Signature) _____ | Gross Source cpm: <u>7293</u> Bkg. cpm: <u>0.1</u> Net Source cpm: <u>7293</u> % Error: <u>-11.0</u> | Shift M6 Time: _____ RCT Emp. # _____ (Print Name / Signature) _____ | Gross Source cpm: _____ Bkg. cpm: _____ Net Source cpm: _____ % Error: _____ |
| Shift P2 Time: _____ RCT Emp. # _____ (Print Name / Signature) _____ | Gross Source cpm: _____ Bkg. cpm: _____ Net Source cpm: _____ % Error: _____ | Shift D6 Time: _____ RCT Emp. # _____ (Print Name / Signature) _____ | Gross Source cpm: _____ Bkg. cpm: _____ Net Source cpm: _____ % Error: _____ |
| Shift M3 Time: _____ RCT Emp. # _____ (Print Name / Signature) _____ | Gross Source cpm: _____ Bkg. cpm: _____ Net Source cpm: _____ % Error: _____ | Shift P6 Time: _____ RCT Emp. # _____ (Print Name / Signature) _____ | Gross Source cpm: _____ Bkg. cpm: _____ Net Source cpm: _____ % Error: _____ |
| Shift O3 Time: <u>0600</u> RCT Emp. # _____ (Print Name / Signature) _____ | Gross Source cpm: <u>7497</u> Bkg. cpm: <u>0.2</u> Net Source cpm: <u>7497</u> % Error: <u>-8.5</u> | Shift M7 Time: _____ RCT Emp. # _____ (Print Name / Signature) _____ | Gross Source cpm: _____ Bkg. cpm: _____ Net Source cpm: _____ % Error: _____ |
| Shift P3 Time: _____ RCT Emp. # _____ (Print Name / Signature) _____ | Gross Source cpm: _____ Bkg. cpm: _____ Net Source cpm: _____ % Error: _____ | Shift D7 Time: _____ RCT Emp. # _____ (Print Name / Signature) _____ | Gross Source cpm: _____ Bkg. cpm: _____ Net Source cpm: _____ % Error: _____ |
| Shift M4 Time: _____ RCT Emp. # _____ (Print Name / Signature) _____ | Gross Source cpm: _____ Bkg. cpm: _____ Net Source cpm: _____ % Error: _____ | Shift P7 Time: _____ RCT Emp. # _____ (Print Name / Signature) _____ | Gross Source cpm: _____ Bkg. cpm: _____ Net Source cpm: _____ % Error: _____ |
| Shift O4 Time: <u>0600</u> RCT Emp. # _____ (Print Name / Signature) _____ | Gross Source cpm: <u>7516</u> Bkg. cpm: <u>0.2</u> Net Source cpm: <u>7516</u> % Error: <u>-7.5</u> | $\% \text{ ERROR} = \frac{(\text{Net cpm}/E) - \text{Source dpm}}{\text{Source dpm}} \times 100$ $\text{Net cpm} = \text{gross} - \text{background cpm}$ | |

E = Efficiency = 0.33 for the SAC-4 and 0.35 for the BC-4

Approved by

CNC Cooper

Signature

8-19-99

Date

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

SWIPE COUNTER PERFORMANCE LOG

| INSTRUMENT MODEL: (Circle One) | | Counter Serial No.: | | ALPHA <input checked="" type="checkbox"/> BETA <input type="checkbox"/> | |
|--------------------------------|--|---------------------|--------------------------------|-------------------------------------------------------------------------|--|
| SAC-4 BC-41/ LUDLUM 2929 | | 835 | | Calibration Due Date: 10-26-99 | |
| Start Date: 8-16-99 | | End Date: 8-22-99 | | Building: 549 | |
| Source: SN 680141 | | D. P. M.: 24830 | | Location: office | |
| Certification Due Date: N/A | | | | | |
| Shift A1 | | | Shift P4 | | |
| Gross Source cpm: _____ | | | Gross Source cpm: _____ | | |
| Time: _____ | | | Time: _____ | | |
| Bgk. cpm: _____ | | | Bgk. cpm: _____ | | |
| RCT Emp. # _____ | | | RCT Emp. # _____ | | |
| Net Source cpm: _____ | | | Net Source cpm: _____ | | |
| % Error: _____ | | | % Error: _____ | | |
| (Print Name / Signature) _____ | | | (Print Name / Signature) _____ | | |
| Shift D1 | | | Shift M5 | | |
| Gross Source cpm: 7060 | | | Gross Source cpm: _____ | | |
| Time: 0600 | | | Time: _____ | | |
| Bgk. cpm: 0.1 | | | Bgk. cpm: _____ | | |
| RCT Emp. # _____ | | | RCT Emp. # _____ | | |
| Net Source cpm: 7060 | | | Net Source cpm: _____ | | |
| % Error: -13.8 | | | % Error: _____ | | |
| (Print Name / Signature) _____ | | | (Print Name / Signature) _____ | | |
| Shift P1 | | | Shift D5 | | |
| Gross Source cpm: _____ | | | Gross Source cpm: _____ | | |
| Time: _____ | | | Time: 0600 | | |
| Bgk. cpm: _____ | | | Bgk. cpm: _____ | | |
| RCT Emp. # _____ | | | RCT Emp. # _____ | | |
| Net Source cpm: _____ | | | Net Source cpm: _____ | | |
| % Error: _____ | | | % Error: _____ | | |
| (Print Name / Signature) _____ | | | (Print Name / Signature) _____ | | |
| Shift M2 | | | Shift P5 | | |
| Gross Source cpm: _____ | | | Gross Source cpm: _____ | | |
| Time: _____ | | | Time: _____ | | |
| Bgk. cpm: _____ | | | Bgk. cpm: _____ | | |
| RCT Emp. # _____ | | | RCT Emp. # _____ | | |
| Net Source cpm: _____ | | | Net Source cpm: _____ | | |
| % Error: _____ | | | % Error: _____ | | |
| (Print Name / Signature) _____ | | | (Print Name / Signature) _____ | | |
| Shift D2 | | | Shift M6 | | |
| Gross Source cpm: 7108 | | | Gross Source cpm: _____ | | |
| Time: 0600 | | | Time: _____ | | |
| Bgk. cpm: 0.8 | | | Bgk. cpm: _____ | | |
| RCT Emp. # _____ | | | RCT Emp. # _____ | | |
| Net Source cpm: 7108 | | | Net Source cpm: _____ | | |
| % Error: -13.3 | | | % Error: _____ | | |
| (Print Name / Signature) _____ | | | (Print Name / Signature) _____ | | |
| Shift P2 | | | Shift D6 | | |
| Gross Source cpm: _____ | | | Gross Source cpm: _____ | | |
| Time: _____ | | | Time: _____ | | |
| Bgk. cpm: _____ | | | Bgk. cpm: _____ | | |
| RCT Emp. # _____ | | | RCT Emp. # _____ | | |
| Net Source cpm: _____ | | | Net Source cpm: _____ | | |
| % Error: _____ | | | % Error: _____ | | |
| (Print Name / Signature) _____ | | | (Print Name / Signature) _____ | | |
| Shift M3 | | | Shift P6 | | |
| Gross Source cpm: _____ | | | Gross Source cpm: _____ | | |
| Time: _____ | | | Time: _____ | | |
| Bgk. cpm: _____ | | | Bgk. cpm: _____ | | |
| RCT Emp. # _____ | | | RCT Emp. # _____ | | |
| Net Source cpm: _____ | | | Net Source cpm: _____ | | |
| % Error: _____ | | | % Error: _____ | | |
| (Print Name / Signature) _____ | | | (Print Name / Signature) _____ | | |
| Shift D3 | | | Shift M7 | | |
| Gross Source cpm: 7254 | | | Gross Source cpm: _____ | | |
| Time: 0600 | | | Time: _____ | | |
| Bgk. cpm: 0.2 | | | Bgk. cpm: _____ | | |
| RCT Emp. # _____ | | | RCT Emp. # _____ | | |
| Net Source cpm: 7254 | | | Net Source cpm: _____ | | |
| % Error: -11.5 | | | % Error: _____ | | |
| (Print Name / Signature) _____ | | | (Print Name / Signature) _____ | | |
| Shift P3 | | | Shift D7 | | |
| Gross Source cpm: _____ | | | Gross Source cpm: _____ | | |
| Time: _____ | | | Time: _____ | | |
| Bgk. cpm: _____ | | | Bgk. cpm: _____ | | |
| RCT Emp. # _____ | | | RCT Emp. # _____ | | |
| Net Source cpm: _____ | | | Net Source cpm: _____ | | |
| % Error: _____ | | | % Error: _____ | | |
| (Print Name / Signature) _____ | | | (Print Name / Signature) _____ | | |
| Shift A1 | | | Shift P7 | | |
| Gross Source cpm: _____ | | | Gross Source cpm: _____ | | |
| Time: _____ | | | Time: _____ | | |
| Bgk. cpm: _____ | | | Bgk. cpm: _____ | | |
| RCT Emp. # _____ | | | RCT Emp. # _____ | | |
| Net Source cpm: _____ | | | Net Source cpm: _____ | | |
| % Error: _____ | | | % Error: _____ | | |
| (Print Name / Signature) _____ | | | (Print Name / Signature) _____ | | |
| Shift D4 | | | Shift P8 | | |
| Gross Source cpm: 6973 | | | Gross Source cpm: _____ | | |
| Time: 0600 | | | Time: _____ | | |
| Bgk. cpm: 0.1 | | | Bgk. cpm: _____ | | |
| RCT Emp. # _____ | | | RCT Emp. # _____ | | |
| Net Source cpm: 6973 | | | Net Source cpm: _____ | | |
| % Error: -14.9 | | | % Error: _____ | | |
| (Print Name / Signature) _____ | | | (Print Name / Signature) _____ | | |

E = Efficiency = 0.33 for the SAC-4 and 0.25 for the BC-4

Approved by

L N Cooper

L Cooper

Emp. # 0210

8-18-99

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

INSTRUMENT DATA

| | | |
|------------------|------------------|---------------|
| Mfg. Eberline | Mfg. Eberline | Mfg. Eberline |
| Model SAC-4 | Model SAC-4 | Model |
| Serial# 835 | Serial# 824 | Serial# |
| Cal Due 10/26/99 | Cal Due 10/13/99 | Cal Due |
| Bkg. 0.1 cpm | Bkg. 0.0 cpm | Bkg. |
| Efficiency 33 % | Efficiency 33 % | Efficiency |
| MDA 6.5 dpm | MDA 6.5 dpm | MDA |

| | | |
|------------------|-----------------|-----------------|
| Mfg. Eberline | Mfg. Eberline | Mfg. |
| Model BC-4 | Model BC-4 | Model |
| Serial# 700 | Serial# 770 | Serial# |
| Cal Due 10/22/99 | Cal Due 1/7/00 | Cal Due |
| Bkg. 41 cpm | Bkg. 38 cpm | Bkg. cpm |
| Efficiency 25 % | Efficiency 25 % | Efficiency % |
| MDA 200 dpm | MDA 200 dpm | MDA ### ### dpm |

Survey Type QA SWIPE SURVEYBuilding: T112 A, B & CLocation: 280 YardPurpose: MARSSIM Release SurveyRWP #: N/ADate: 08-16-99 Time: 14:00
 RCT: Hersey / [REDACTED]
 Print name Signature

 RCT: Espinoza / [REDACTED]
 Print name Signature

PRL #: _____

Comments: _____

Alpha removable was a two minute count.

SURVEY RESULTS

| Swipe # | Location/Description (Results in DPM/100CM ²) | Removable | | Total | | Swipe # | Location/Description (Results in DPM/100CM ²) | Removable | | Total | |
|---------|--------------------------------------------------------------|-----------|------|-------|------|---------|--------------------------------------------------------------|-----------|------|-------|------|
| | | Alpha | Beta | Alpha | Beta | | | Alpha | Beta | Alpha | Beta |
| 1 | T112A ROOM 4 WALL A6* | 1.5 | -12 | | | 21 | | | | | |
| 2 | T112A ROOM 6 FLOOR A1* | 1.5 | -20 | | | 22 | | | | | |
| 3 | T112A ROOM 8 WALL P2* | 0.0 | 4 | | | 223 | | | | | |
| 4 | T112A ROOM 9 FLOOR A3* | 0.0 | -36 | | | 24 | | | | | |
| 5 | T112A ROOM 11 WALL K1* | 0.0 | -32 | | | 25 | | | | | |
| 6 | T112A EXTERIOR WEST WALL B1* | 0.0 | -28 | | | 26 | | | | | |
| 7 | T112A EXTERIOR NORTH WALL A1* | 0.0 | 0 | | | 27 | | | | | |
| 8 | T112A EXTERIOR EAST WALL K3* | 1.5 | -20 | | | 28 | | | | | |
| 9 | T112A EXTERIOR SOUTH WALL E3* | 0.0 | -48 | | | 29 | | | | | |
| 10 | T112A EXTERIOR ROOF A2* | 0.0 | 40 | N/A | | 30 | N/A | | | | |
| 11 | T112B ROOM 1 CEILING B3* | 4.5 | -24 | | | 31 | | | | | |
| 12 | T112B ROOM 2 FLOOR H1* | 0.0 | -20 | | | 32 | | | | | |
| 13 | T112B EXTERIOR SOUTH WALL E2* | 4.5 | 24 | | | 33 | | | | | |
| 14 | T112B EXTERIOR NORTH WALL L1* | 1.5 | -24 | | | 34 | | | | | |
| 15 | T112B EXTERIOR ROOF F1* | 0.0 | 0 | | | 35 | | | | | |
| 16 | T112C ROOM 1 FLOOR C1* | 0.0 | 4 | | | 36 | | | | | |
| 17 | T112C ROOM 3 WALL J2* | 0.0 | 20 | | | 37 | | | | | |
| 18 | T112C ROOM 5 WALL H1* | 0.0 | -56 | | | 38 | | | | | |
| 19 | T112C ROOM 6 FLOOR C1* | 1.5 | 16 | | | 39 | | | | | |
| 20 | T112C EXTERIOR ROOF M3* | 4.5 | 4 | | | 40 | | | | | |

 Site Reviewed: _____ RS Supervision: _____
 Print Name Signature Emp. #

| removable | | total | |
|-----------|------|--------|------|
| counts | | counts | |
| alpha | beta | alpha | beta |

| | | | | |
|----|---|----|--|--|
| 1 | 1 | 38 | | |
| 2 | 1 | 36 | | |
| 3 | 0 | 42 | | |
| 4 | 0 | 32 | | |
| 5 | 0 | 33 | | |
| 6 | 0 | 34 | | |
| 7 | 0 | 41 | | |
| 8 | 1 | 36 | | |
| 9 | 0 | 29 | | |
| 10 | 0 | 51 | | |
| 11 | 3 | 35 | | |
| 12 | 0 | 36 | | |
| 13 | 3 | 47 | | |
| 14 | 1 | 35 | | |
| 15 | 0 | 41 | | |
| 16 | 0 | 42 | | |
| 17 | 0 | 46 | | |
| 18 | 0 | 27 | | |
| 19 | 1 | 45 | | |
| 20 | 3 | 42 | | |
| 21 | | | | |
| 22 | | | | |
| 23 | | | | |
| 24 | | | | |
| 25 | | | | |
| 26 | | | | |
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| 37 | | | | |
| 38 | | | | |
| 39 | | | | |
| 40 | | | | |

CONFIDENTIAL ONLY

Sanford Cohen & Associates Southeastern Environmental Laboratory

Radioanalytical Results

Report Identification Number: 89A8967

| | | |
|------------------------------------------|---------------------------------------------|-------------------------------|
| Project Name: <u>Kalamath Hill</u> | Chain-of-Custody Number: <u>89A8967#002</u> | Matrix: <u>Waste</u> |
| Site Sample ID: <u>003.002</u> | | |
| Other Sample ID: <u>T112 B NW CORNER</u> | Collection Date: <u>7/21/99</u> | Date Received: <u>7/27/99</u> |
| | Batch Number: <u>1843</u> | Laboratory Code: <u>SCA</u> |

| Method Number | Radionuclide | Laboratory Sample ID | Activity (pCi/g) | 2 σ Counting Error (pCi/g) | Total Error (pCi/g) | MDA (pCi/g) |
|---------------|--------------|----------------------|------------------|-----------------------------------|---------------------|-------------|
| ACW03 | U-233/234 | KH199-1843-03 | 0.030 | 0.049 | 0.050 | 0.076 |
| ACW03 | U-238 | KH199-1843-03 | 0.000 | 0.000 | 0.000 | 0.045 |
| ACW03 | U-238 | KH199-1843-03 | 0.035 | 0.048 | 0.048 | 0.084 |
| ACW03 | PU-238/240 | KH199-1843-03 | 0.022 | 0.044 | 0.044 | 0.059 |
| ACW03 | AM-241 | KH199-1843-03B | 2.37 | 0.740 | 0.878 | 0.119 |

| Quality Control Samples | | | |
|-------------------------|--------------------------------|------------------------------------|------------------------|
| Radionuclide | Laboratory Control Sample (LC) | Laboratory Duplicate Analysis (LD) | Preparation Blank (PB) |
| U | SCAQC-1843-LC1 | SCAQC-1843-LD1 | SCAQC-1843-PB |
| Pu | SCAQC-1843-LC1 | SCAQC-1843-LD1 | SCAQC-1843-PB |
| Am | SCAQC-1843-LC1 | SCAQC-1843-LD1 | SCAQC-1843-PB |

PRELIMINARY
INFORMATION

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Sanford Cohen & Associates Southeastern Environmental Laboratory

Radioanalytical Results

Report Identification Number: 99A8967

| | | |
|--------------------------------------------|---------------------------------------------|-------------------------------|
| Project Name: <u>Kaiser-Hill</u> | Chain-of-Custody Number: <u>99A8967/002</u> | Matrix: <u>Waste</u> |
| Site Sample ID: <u>004.002</u> | | |
| Other Sample ID: <u>T112 B.N.E. CORNER</u> | Collection Date: <u>7/21/89</u> | Date Received: <u>7/27/89</u> |
| | Batch Number: <u>1643</u> | Laboratory Code: <u>SCA</u> |

| Method Number | Radionuclide | Laboratory Sample ID | Activity (pCi/g) | 2 σ Counting Error (pCi/g) | Total Error (pCi/g) | MDA (pCi/g) |
|---------------|--------------|----------------------|------------------|-----------------------------------|---------------------|-------------|
| ACW03 | U-235/234 | KH199-1643-04 | 0.088 | 0.061 | 0.082 | 0.037 |
| ACW03 | U-235 | KH199-1643-04 | 0.017 | 0.033 | 0.034 | 0.046 |
| ACW03 | U-238 | KH199-1643-04 | 0.013 | 0.027 | 0.027 | 0.037 |
| ACW03 | PU-239/240 | KH199-1643-04 | -0.010 | 0.020 | 0.020 | 0.117 |
| ACW03 | Am-241 | KH199-1643-04B | 0.000 | 0.000 | 0.000 | 0.088 |

| Quality Control Samples | | | |
|-------------------------|--------------------------------|------------------------------------|------------------------|
| Radionuclide | Laboratory Control Sample (LC) | Laboratory Duplicate Analysis (LD) | Preparation Blank (PB) |
| U | SCAQC-1643-LC1 | SCAQC-1643-LD1 | SCAQC-1643-PB |
| Pu | SCAQC-1643-LC1 | SCAQC-1643-LD1 | SCAQC-1643-PB |
| Am | SCAQC-1643-LC1 | SCAQC-1643-LD1 | SCAQC-1643-PB |

PRELIMINARY
INFORMATION

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**Sanford Cohen & Associates
Southeastern Environmental Laboratory**

Radioanalytical Results

**Quality Control Sample
Preparation Blank (PB)**

Report Identification Number: 99A8967

| | | |
|----------------------------------|--------------------------------------|-------------------------------|
| Project Name: <u>Kaiser-Hill</u> | Chain-of-Custody Number: <u>None</u> | Matrix: <u>Water</u> |
| Site Sample ID: <u>N/A</u> | | |
| Other Sample ID: <u>PB</u> | Collection Date: <u>7/27/99</u> | Date Received: <u>7/27/99</u> |
| | | Laboratory Code: <u>SCA</u> |

| Method Number | Radionuclide | Laboratory Sample ID | Activity (dpm) | 2 σ Counting Error (dpm) | Total Error (dpm) | MDA (dpm) |
|---------------|--------------|----------------------|----------------|---------------------------------|-------------------|-----------|
| ACW03 | U-233/234 | SCAQC-1643-PB | 0.043 | 0.049 | 0.050 | 0.039 |
| ACW03 | U-235 | SCAQC-1643-PB | 0.000 | 0.000 | 0.000 | 0.048 |
| ACW03 | U-238 | SCAQC-1643-PB | 0.079 | 0.071 | 0.072 | 0.068 |
| ACW03 | PLU-239/240 | SCAQC-1643-PB | 0.000 | 0.000 | 0.000 | 0.056 |
| ACW03 | AM-241 | SCAQC-1643-PB | 0.000 | 0.000 | 0.000 | 0.063 |

| Quality Control Samples | | | |
|-------------------------|--------------------------------|------------------------------------|------------------------|
| Radionuclide | Laboratory Control Sample (LC) | Laboratory Duplicate Analysis (LD) | Preparation Blank (PB) |
| U | SCAQC-1643-LC1 | SCAQC-1643-LD1 | SCAQC-1643-PB |
| Pu | SCAQC-1643-LC1 | SCAQC-1643-LD1 | SCAQC-1643-PB |
| Am | SCAQC-1643-LC1 | SCAQC-1643-LD1 | SCAQC-1643-PB |

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**PRELIMINARY
INFORMATION**

Sanford Cohen & Associates Southeastern Environmental Laboratory

Radioanalytical Results

Quality Control Sample Evaluation

Report Identification Number: 99A8967

Project Name: Kaber Hill

Laboratory Code: SCA

Laboratory Control Sample (LC1) Evaluation (CV)

| Method Number | Radionuclide | Laboratory Sample ID | Decay Corrected Activity of Spike Added (dpm) | (OV) Laboratory Control Sample Activity (dpm) | Laboratory Control Sample % Recovery (Accuracy) | Number of σ Between CV and OV |
|---------------|--------------|----------------------|-----------------------------------------------|-----------------------------------------------|-------------------------------------------------|--------------------------------------|
| ACW03 | AM-241 | SCAQC-1643-LC1 | 4.24 \pm 0.117 | 4.38 \pm 1.17 | 103 | 0.191 |
| ACW03 | PU-239/240 | SCAQC-1643-LC1 | 4.58 \pm 0.100 | 5.13 \pm 1.37 | 113 | 0.873 |
| ACW03 | U-233/234 | SCAQC-1643-LC1 | 8.02 \pm 0.321 | 7.28 \pm 1.75 | 90.3 | 0.650 |
| ACW03 | U-238 | SCAQC-1643-LC1 | 8.02 \pm 0.321 | 7.74 \pm 1.86 | 96.4 | 0.231 |

Laboratory Duplicate Sample (LD1) Evaluation

| Method Number | Radionuclide | Laboratory Sample ID | Original Sample Activity (pCi/g) | Duplicate Sample Activity (pCi/g) | Difference Between Original Activity and Duplicate Sample Activity (F) | Ratio of the Difference Between the Sample Activities and the Propagated Measurement Uncertainty of the Difference at 2 σ (F/F) |
|---------------|--------------|----------------------|----------------------------------|-----------------------------------|------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| ACW03 | U-233/234 | SCAQC-1643-LD1 | 0.264 \pm 0.129 | 0.244 \pm 0.133 | 0.020 | 0.108 |
| ACW03 | U-238 | SCAQC-1643-LD1 | 0.018 \pm 0.031 | 0.018 \pm 0.037 | 0.003 | 0.055 |
| ACW03 | U-238 | SCAQC-1643-LD1 | 0.270 \pm 0.132 | 0.170 \pm 0.109 | 0.100 | 0.687 |
| ACW03 | PU-239/240 | SCAQC-1643-LD1 | 0.000 \pm 0.000 | 0.041 \pm 0.059 | 0.041 | 0.696 |
| ACW03 | AM-241 | SCAQC-1643-LD1 | 0.000 \pm 0.000 | 0.054 \pm 0.078 | 0.054 | 0.696 |

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PRELIMINARY INFORMATION

CAS SAMPLE REQUEST WORKSHEET

RIN: 99A8967
 EVENT: 001
 DUPLICATE ID: N/A
 ISSUE DATE: 7/19/99

WASTE STREAM ID: N/A
 CUSTOMER SAMPLE ID: ↓
 FIELD BLANK ID: ↓
 EQUIPMENT BLANK ID: ↓
 TRIP BLANK: ↓

Comments/Problems encountered during sampling: Temp in upper 80's
Slight breeze. Tar roof excels temp. Sample taken in
4 inch squares.

001.001 Rad Screen Final measurement 12" x 16" area taken for
 Sample at 126 grams - IsotopK 001.002 wt 144 grams 12" x 16" area

Location Description: T 112 A Center

Other ID: Center Sample location

Sample Appearance: Black solid chunks with silver material
present. Sample could contain tar.

Sampling Device: Stainless Scraper

Sample Date: 7-21-99 Sample Time: 1200 Rad Screen Date: 7-21-99
1200 cnd

Was generator notified to receive excess sample? (YES) X (NO)

Samplers Signature: CEH D. Tim

Employee Number: [REDACTED]

Date: 7-21-99 7-21-99

CAS SAMPLE REQUEST WORKSHEET

RIN: 99A8667
 EVENT: 002
 DUPLICATE ID: N/A
 ISSUE DATE: 7/19/99

WASTE STREAM ID: N/A
 CUSTOMER SAMPLE ID:
 FIELD BLANK ID:
 EQUIPMENT BLANK ID:
 TRIP BLANK: ✓

Comments/Problems encountered during sampling: Temp in upper 80's, slight breeze
- Rad screen 002.001 wt, 125 grams taken in 12 x 16 inch area
- Isotopic 002.002 wt 129 grams taken in 12 x 16 inch area

Tar Roof excels temperature.

Location Description: T 112 A

Other ID: South West Corner

Sample Appearance: Black solid chunk Some Silver material present, sample could contain tar

Sampling Device: Stainless Scraper

Sample Date: 7-21-99 Sample Time: 1230 Rad Screen Date: 7-21-99

Was generator notified to receive excess sample? (YES) ✓ (NO)

Samplers Signature: CCN [signature] D. Zipp [signature]
 Employee Number: [redacted]

Date: 7-21-99 7-21-99

CAS SAMPLE REQUEST WORKSHEET

RIN: 99A8967
EVENT: 003
DUPLICATE ID: N/A
ISSUE DATE: 7-19-99

WASTE STREAM ID: N/A
CUSTOMER SAMPLE ID:
FIELD BLANK ID:
EQUIPMENT BLANK ID:
TRIP BLANK: ✓

Comments/Problems encountered during sampling: on ladder while taking
Sample Temp upper 80's problems cutting out sample.
RadScreen 003.001 130 grams, 4x16 inch sample used.
Isotopic 003.002 125 grams, 4x16 inch sample used.

Location Description: T 112 B

Other ID: North West Corner

Sample Appearance: Gray metal, light gauge

Sampling Device: Tin Snips

Sample Date: 7-21-99 Sample Time: 1300 Rad Screen Date: 7-21-99

Was generator notified to receive excess sample? (YES) ✓ (NO)

Samplers Signature: CEA [signature] D. [signature]

Employee Number: [redacted]

Date: 7-21-99 7-21-99

CAS SAMPLE REQUEST WORKSHEET

RIN: 99A8967
EVENT: 004
DUPLICATE ID: N/A
ISSUE DATE: 7-19-99

WASTE STREAM ID: N/A
CUSTOMER SAMPLE ID:
FIELD BLANK ID:
EQUIPMENT BLANK ID:
TRIP BLANK:

Comments/Problems encountered during sampling: Temp lower 90'S Sampled
on a ladder. Problems collecting sample
Radscreen 004.001 - 127 grams 6X16 inch sample used.
Isotopic 004.002 - 138 grams 10X8 inch sample used

Location Description: T/12B

Other ID: North East corner

Sample Appearance: Grey metal, light gauge, Tar and
a Silicon type glue on metal.

Sampling Device: TM Saps

Sample Date: 7-21-99 Sample Time: 1315 Rad Screen Date: 7-21-99

Was generator notified to receive excess sample? (YES) ☒ (NO) ☐

Samplers Signature: CEH D. Z...

Employee Number: [REDACTED]

Date: 7-21-99

7-21-99

SAMPLE SUMMARY FOR RIN: 99A8967

RIN Title: WA
 Project Name: D&D PROJECTS
 Task Name: T-112
 Aggregate Area: WA

Sampling Team: CAS
 Sampling Mgr/Coordinator: Paul Wojtaszek
 Samplers: _____
 Field Logbook ID: 94 Van
 Media: SOLID

This sample summary is supplied to waste generators as notification of sample collection. Inquires into the status of this sampling effort may be directed to the Analytical Services Division (ASD).

| Bottle Number | Customer Bottle Number | Location | LIC (Sec Attached) | Laboratory | Date Collected | Date Shipped | Date Returned | Comments |
|-----------------|------------------------|----------|--------------------|-----------------------|----------------|--------------|---------------|----------|
| 99A8967-001.001 | | T-112 | 1 | Thermo NuTech | | | | |
| 99A8967-001.002 | | T-112 | 2 | S. Cohen & Associates | | | | |
| 99A8967-002.001 | | T-112 | 1 | Thermo NuTech | | | | |
| 99A8967-002.002 | | T-112 | 2 | S. Cohen & Associates | | | | |
| 99A8967-003.001 | | T-112 | 1 | Thermo NuTech | | | | |
| 99A8967-003.002 | | T-112 | 2 | S. Cohen & Associates | | | | |
| 99A8967-004.001 | | T-112 | 1 | Thermo NuTech | | | | |
| 99A8967-004.002 | | T-112 | 2 | S. Cohen & Associates | | | | |

Returning Excess Sample Material:

Unmodified sample material remaining after analysis is generally returned to the generator. The generator must be prepared to receive and dispose of excess sample material for applicable state and federal regulations. Regulatory exclusions for returning excess sample material are specified in the Code of Colorado Regulation (CCR) 1007-3, Part 261.4(d) 'Samples'. If problems with the disposal of excess sample material are encountered the Environmental Coordinator for the generation area should be contacted for resolution of the issues. Only sample material which has not been modified during analysis will be returned. Material which has been acidified for preservation purposes will not be returned.

Customer Acknowledgement:

(Sign and Print Name)

Paul Wojtaszek
PAUL WOJTASZEK

Comments:

Line Item Codes:

- 1) OS01A003 (Rad-Screen - Solid)
- 2) RC01B003 (Isotopic (Soil))

TITLE:

RIN: 99A8

Date: 7/19

6:59 PM

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SAMPLE SUMMARY FOR RIN: 99A8967

RIN Title: N/A
 Project Name: D&D PROJECTS
 Task Name: T-112
 Aggregate Area: N/A

Sampling Team: CAD
 Sampling Mgr/Coordinator: ~~Paul Wojtacek~~ Paul Wojtacek
 Samplers: CA, DL
 Field Logbook ID: 94 Van
 Media: SOLID

This sample summary is supplied to waste generators as notification of sample collection. Inquires into the status of this sampling effort may be directed to the Analytical Services Division (ASD).

| Bottle Number | Customer Bottle Number | Location | LIC (See Attached) | Laboratory | Date Collected | Date Shipped | Date Returned | Comments |
|-----------------|------------------------|----------|--------------------|-----------------------|----------------|----------------|---------------|----------|
| 99A8967-001.001 | <u>T112B Center</u> | T-112 | 1 | Thermo NuTech | <u>7-21-99</u> | <u>7-21-99</u> | | |
| 99A8967-001.002 | ↓ | T-112 | 2 | S. Cohen & Associates | ↓ | ↓ | | |
| 99A8967-002.001 | <u>T112B SW Corner</u> | T-112 | 1 | Thermo NuTech | ↓ | ↓ | | |
| 99A8967-002.002 | ↓ | T-112 | 2 | S. Cohen & Associates | ↓ | ↓ | | |
| 99A8967-003.001 | <u>T112B NW Corner</u> | T-112 | 1 | Thermo NuTech | ↓ | ↓ | | |
| 99A8967-003.002 | ↓ | T-112 | 2 | S. Cohen & Associates | ↓ | ↓ | | |
| 99A8967-004.001 | <u>T112B NE Corner</u> | T-112 | 1 | Thermo NuTech | ↓ | ↓ | | |
| 99A8967-004.002 | ↓ | T-112 | 2 | S. Cohen & Associates | ↓ | ↓ | | |

Returning Excess Sample Material:

Unmodified sample material remaining after analysis is generally returned to the generator. The generator must be prepared to receive and dispose of excess sample material for applicable state and federal regulations. Regulatory exclusions for returning excess sample material are specified in the Code of Colorado Regulation (CCR) 1007-3, Part 261.4(d) 'Samples'. If problems with the disposal of excess sample material are encountered, the Environmental Coordinator for the generation area should be contacted for resolution of the issues. Only sample material which has not been modified during analysis will be returned. Material which has been acidified for preservation purposes will not be returned.

Customer Acknowledgement: _____
 (Sign and Print Name)

Comments:

Line Item Codes:

- 1) OS01A003 (Rad-Screen - Solid)
- 2) RC01B003 (Isotopic (Soil))

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Thermo NUTech - Rocky Flats
Radscreen Results

RUN: 99A8967
Analysis: Radscreen
Report Date: 07/26/99

Distribution/Fax: ASD/4556

| Laboratory Sample ID | APO Sample ID | | | Matrix | Gross Alpha | | Gross Beta | | Total Activity pCi/g | DOT Class |
|-------------------------|---------------|-------|--------|--------|-------------|------------|------------|------------|-------------------------|--------------|
| | RIN | Event | Bottle | | pCi/g | 2 σ | pCi/g | 2 σ | | |
| 99070249-01 | 99A8967 | 001 | 001 | Waste | 5.6 | 3.2 | 9.3 | 3.1 | 21.20 | NONRAD |
| 99070249-02 | 99A8967 | 002 | 001 | Waste | 3.6 | 2.2 | 4.0 | 2.1 | 11.90 | NONRAD |
| 99070249-03 | 99A8967 | 003 | 001 | Waste | 3.8 | 6.3 | 11.0 | 7.0 | 28.10 | NONRAD |
| 99070249-04 | 99A8967 | 004 | 001 | Waste | 5.3 | 5.0 | -0.8 | 4.2 | 14.50 | NONRAD |

DOT Classification <2000 pCi/g total activity is NONRAD
>= 2000 pCi/g total activity is RAD

Total Activity Calculated as the sum of the gross alpha and beta activities AND the measurement uncertainties for these two measurements.
If the measured activity is negative, 0 pCi/g (instead of the negative value) is used to calculate the total activity.

Analysis Methods Sample Preparation Procedures: ATP-005, "Preparation of Oils, Solvents and Combustibles for Analysis of Gross Alpha and Beta Activity" (1 g aliquot) and L-6278-A, "Sample Preparation for Radiological Screening by Gas Proportional Counting".
Counting Procedure: ATP-008, "Operation of Tennesse LB4100 Gas Proportional Counters".

Kathy Hagglund Date 7/26/99
Technical Review

Donald R. Taylor Date 7/26/99
Quality Assurance Review



KAISER•HILL
COMPANY
ANALYTICAL SERVICES DIVISION

FAX COVER SHEET FOR PRELIMINARY DATA REPORTS

RIN NUMBER: 99A8967

FROM: TOM SZYDLOWSKI

PHONE: (303) 966-8165

FAX: (303) 966-4555

TO: Wojtaszek

FAX: 4046

PHONE: _____

NUMBER OF PAGES, INCLUDING COVER SHEET: _____

Please contact _____ if the fax is not received in its entirety.
(phone number)

NOTE:

If the accompanying data is stamped preliminary it is because the final data package has not been received and validated or verified. Until the data is validated or verified it must be considered preliminary. Final data is usually not received until 30 days after the laboratory has received the sample. Verification or validation is completed a short time following receipt of the final data package. You will be sent a copy of the verification or validation report, which you should review. If qualifiers have been attached to individual results they may affect the way that you use the data. If you have any question please contact your Analytical Services Project Lead, do not contact the laboratory directly.

1003.002

2.37 $\mu\text{Ci/gm}$ ^{241 Am}

$\frac{2}{16}$
 $\frac{4}{64}$

$$\frac{2.37 \mu\text{Ci}}{\text{gm}} \times \frac{125 \text{ gm}}{64 \text{ in}^2} \times \frac{(1 \text{ inch})^2}{(2.54 \text{ cm})^2} \times \frac{2.2 \times 10^{12} \text{ dpm}}{\mu\text{Ci}}$$

$2.2 \times 10^{12} \text{ dpm/g}$
9 μCi
6 μCi
3 μCi
0 μCi

$$\frac{(2.37)(125)(1)(2.2)}{(64)(2.54)(2.54)} = \frac{\text{dpm}}{\text{cm}^2} = \frac{651.75}{412.9024}$$

$$= 1.578 \text{ dpm/cm}^2$$

$$= \frac{157.8 \text{ dpm}}{100 \text{ cm}^2}$$

ANALYTICAL SERVICES DIVISION
SAMPLING AND ANALYSIS REQUEST FORM

| | | |
|-------------------------------------|-----------------------|--------------|
| RIN: <u>99A8967</u> | Priority: <u>Push</u> | ASD USE ONLY |
| ASD Project Lead: <u>Szydlowski</u> | Phone: <u>8165</u> | Pager: _____ |

CUSTOMER INFORMATION

Date: 07/19/99Project Charge No.: 150104-20Requestor: PAUL A. WOJASZEKPhone: x 3125

Pager: _____

Bldg: T893BFax: x 4046Secondary Contact: DAVE BARNESPhone: x 5352Pager: 212-6541Bldg: T130B

Fax: _____

Fax Data Results To: PAUL A. WOJASZEKPhone: x 3125Fax: x 4046

SAMPLE INFORMATION

Sample Location: T112A, T112BSample Description and
Sample Identifiers

Sample Matrix:

☐

Aqueous

☐

Org. Liqui

☒

Solid

☐

Sludge

☐

Multi Phase

When will sample be available for sampling? 6:00 AM, TUES, 07/20/99When is data required by requestor? 08/06/99 - ASAP

Estimated quantity Available for Sampling: _____

Waste Stream ID No. (if known): _____

Waste Stream Name (if known): _____

EPA CODES: _____

MSDS: ☐ Yes ☒ NoATTACHED: ☐ Yes ☒ No

COMPATIBILITY CODE: _____

WFO IUC: _____

90 Day Area? ☐ Yes ☒ No

Start Date: _____

End Date: _____

ANALYSES REQUESTED

☒ Alpha/Beta Screen☐ Total VOA☐ TCLP VOA☐ pH

Other: _____

☐ Gross Alpha/Beta☐ Total SVOAS☐ TCLP SVOAS☐ Fingerprint☒ Teletypes☐ Total Metals (ICP)☐ TCLP Metals☐ IR☐ g/l Teletypes☐ Total PCBs☐ TCLP PCBsAnalyses Criticality Sensitive? ☐ Yes ☒ No☐ Gamma Spec☐ Total Herbicides☐ TCLP Herbicidesif Yes ☐ Single ☐ Double

RADIOLOGICAL ENTRY REQUIREMENTS

IS THIS A RADIOACTIVE WASTE STREAM?

Suspected to be radioactive? ☐ Yes ☒ No

Located in:

☐

RBA

☐

RMA

☐

PMMA

☐

CA

☐

HCA

☐

RA

☐

HRA

☐

Other Area: _____

RCT Support:

☒

Yes

☐

No

Comments: _____

RWP Required:

☐

Yes

☒

No

PWS Required:

☒

Yes

☐

No

GENERAL ENTRY REQUIREMENTS/SAFETY CONCERNS

☒ Plan of the Day☒ Industrial Hygiene Assistance☐ Electrical☐ Maintenance Assistance☐ Carcinogen Control Area☐ IWCP☐ Operator's Assistance☐ Lock-out/Tag-out☐ Confined Space☐ Mechanical☐ Waste Contains Fluorides

Other: _____

Special Instructions

Samplers require ladder safety training. There may be two (2) samplers with this training.Requestor Signature: Paul A. WojaszekDate: 07/19/99

Note: Excess sample will be returned to generator.

7 - 19 - 99

ANALYTICAL SERVICES DIVISION SAMPLING AND ANALYSIS REQUEST FORM

ASD USE ONLY

RIN: 99A8967 Priority: _____
ASD Project Lead: SZYDLOWSKI, TOM Phone: 8165 Pager: _____

CUSTOMER INFORMATION

Date: 07/19/1999
Project Charge No.: 02017100
Requestor: WOJTASCEK Phone: 3125 Pager: _____
Bldg: _____ Fax: _____
Secondary Contact: BARNES, DAVE Phone: 5352 Pager: _____
Bldg: _____ Fax: _____
Fax Data Results To: WOJTASZEK Phone: 4046 Fax: _____

SAMPLE INFORMATION

Sample Location: T-112
Sample Description and Sample Identifiers: Roffing material
Sample Matrix: ☐ Aqueous ☐ Org. Liquid ☒ Solid ☐ Sludge ☐ Multi Phase
When will sample be available for sampling? 07/20/1999
When is data required by requestor? 08/05/1999
Estimated quantity Available for Sampling: _____
Waste Stream ID No. (if known): _____ Waste Stream Name (if known): _____
EPA CODES: _____ MSDS: ☐ Yes ☒ No ATTACHED: ☐ Yes ☒ No
COMPATIBILITY CODE _____ WFC/ IDC: _____
90 Day Area? ☐ Yes ☒ No Start Date: _____ End Date: _____

ANALYSES REQUESTED

☒ Alpha/Beta Screen ☐ Total VOA ☐ TCLP VOA ☐ pH Other: _____
☐ Gross Alpha/Beta ☐ Total SVOAS ☐ TCLP SVOAS ☐ Fingerprint _____
☒ Isotopics ☐ Total Metals (ICP) ☐ TCLP Metals ☐ IR _____
☐ g/l Isotopics ☐ Total PCBs ☐ TCLP PCBs Analyses Criticality Sensitive? ☐ Yes ☒ No
☐ Gamma Spec ☐ Total Herbicides ☐ TCLP Herbicides If Yes: ☐ Single Analyses: _____
☐ Double _____

RADIOLOGICAL ENTRY REQUIREMENTS

IS THIS A RADIOACTIVE WASTE STREAM? Suspected to be radioactive? ☐ Yes ☒ No
☐ Pu ☐ Am ☐ U Other: _____
Located In: ☐ RBA ☐ RMA ☐ RMMA ☐ CA ☐ HCA ☐ RA ☐ HRA Other Area: _____
RCT Support: ☒ Yes ☐ No Comments: _____
RWP Required: ☐ Yes ☒ No
PWRE Required: ☒ Yes ☐ No

GENERAL ENTRY REQUIREMENTS/SAFETY CONCERNS

☒ Plan of the Day ☒ Industrial Hygiene Assistance ☐ Electrical
☐ Maintenance Assistance ☐ Carcinogen Control Area ☐ IWCP
☐ Operator's Assistance ☐ Lock-out/Tag-out ☐ Confined Space
☐ Mechanical ☐ Waste Contains Fluorides Other: _____

Special Instructions: Both persons sent to sample this job must have current ladder safety training.

Requestor Signature: _____

Date: 07/21/99

Note: Excess sample will be returned to generator.

| | | | | | | | | |
|--------------------------------------------------------------------|--|------------------------------------------|--|--|--------------------------------------------------------------------|--|--------------------------------|--|
| Commodore Advanced Sciences, Inc. | | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | | | | | C.O.C. # 99A8967#002 | |
| | | | | | | | Page <u>1</u> of <u>1</u> | |
| Collector <i>CE Asmptt</i> [Redacted] <i>1297-99</i> [Redacted] | | Contact/Requester WOJTASCEK | | | Telephone No. 3125 | | MSIN FAX <i>N/A</i> | |
| RIN 99A8967 | | Sampling Origin T-112 | | | Purchase Order/Charge Code 02017100 | | | |
| Project Title <i>N/A</i> | | Logbook No. <i>94 Van</i> | | | Ice Chest No. <i>N/A</i> | | Temp. <i>26.4m</i> | |
| To (Lab) S. Cohen & Associates | | Method of Shipment <i>Fed. Ex</i> | | | Bill of Lading/Air Bill No. | | | |
| Protocol <i>CAS-SOP. 003</i> | | | | | Offsite Property No. | | | |
| POSSIBLE SAMPLE HAZARDS/REMARKS ** ** | | | | | SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption: Yes No | | | |
| <i>possible Tar present in Sample</i> | | | | | | | | |

| Bottle No. | Customer Number | Matrix | Date | Time | Location | No/Type Container | Sample Analysis | Preservative: Packing |
|--------------------|---------------------------|--------|----------------|-------------|----------|-------------------|-----------------------------------|-----------------------|
| 99A8967-001.002 | <i>T112 A Center</i> | SOLID | <i>7-21-99</i> | <i>1200</i> | T-112 | 125-G P/G | RC01B003 (Isotopic (Soil)) [Rush] | None 4 degrees C |
| 99A8967-002.002 | <i>T112 A S.W. Corner</i> | SOLID | | <i>1230</i> | T-112 | 125-G P/G | RC01B003 (Isotopic (Soil)) [Rush] | None 4 degrees C |
| 99A8967-003.002 | <i>N.W. T112B Corner</i> | SOLID | | <i>1300</i> | T-112 | 125-G P/G | RC01B003 (Isotopic (Soil)) [Rush] | None 4 degrees C |
| 99A8967-004.002 | <i>N.E. T112B Corner</i> | SOLID | | <i>1315</i> | T-112 | 125-G P/G | RC01B003 (Isotopic (Soil)) [Rush] | None 4 degrees C |
| <i>661 7-21-99</i> | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

| | | | | | | | |
|--------------------------------------|--|----------------------------------|--|-------------------------------------|--|----------------------------------|--|
| Relinquished By: <i>CE Asmptt</i> | | Date/Time <i>7-21-99 1500</i> | | Received By: <i>Ref #2 T891R</i> | | Date/Time <i>7-21-99 1500</i> | |
| Relinquished By: | | Date/Time | | Received By: | | Date/Time | |
| Relinquished By: | | Date/Time | | Received By: | | Date/Time | |
| Relinquished By: | | Date/Time | | Received By: | | Date/Time | |

| | | | | | | | |
|-----------------------|--|--------------------------------------------------------------------------------|--|-------------|--|-----------|--|
| FINAL SAMPLE DISPOSIT | | Disposal Method (e.g., Return to customer, per lab procedure, used in process) | | Disposed By | | Date/Time | |
|-----------------------|--|--------------------------------------------------------------------------------|--|-------------|--|-----------|--|

Commodore Advanced Sciences, Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

99A8967#001

C.O.C. #

Collector

99A8967

Project Title

To (Lab)

Thermo NuTech

Protocol

POSSIBLE SAMPLE HAZARDS/REMARKS

possible for present in

SPECIAL INSTRUCTIONS

Hold Time

Total Activity Exemption: Yes ☐ No ☐

COPY

Contact/Requester

WOLASCEK

Sampling Origin

Logbook No.

Method of Shipment

Vehicle

94 Van

Telephone No.

MSDN

FAX

Purchase Order/Charge Code

3125

Ice Chest No.

N/A

Temp.

Bill of Lading/Air Bill No.

N/A

Offsite Property No.

N/A

Boite No.

Customer Number

Matrix

Date

Time

Location

No/Type Container

Sample Analysis

Preservative: Packing

Relinquished By:

Date/Time

Received By:

Date/Time

Relinquished By:

Date/Time

Received By:

Date/Time

Relinquished By:

Date/Time

Received By:

Date/Time

Relinquished By:

Date/Time

Received By:

Date/Time

Relinquished By:

Date/Time

Received By:

Date/Time

Relinquished By:

Date/Time

Received By:

Date/Time

FINAL SAMPLE DISPOSITION

Disposal Method (e.g., Return to customer, per lab procedure, used in process)

Disposed By:

Date/Time

Sanford Cohen & Associates
Southeastern Environmental Laboratory

Radioanalytical Results

Quality Control Tracer Yield

Report Identification Number: 99A8967

Project Name: Kaiser Hill

Laboratory Code: SCA

| <u>Laboratory Sample ID</u> | <u>Am-243</u> | <u>Pu-242</u> | <u>U-232</u> |
|-----------------------------|---------------|---------------|--------------|
| KH199-1643-01 | 43.21 | 80.72 | 91.08 |
| KH199-1643-02 | 69.25 | 75.38 | 96.53 |
| KH199-1643-03 | | 62.71 | 89.6 |
| KH199-1643-03B | 63.58 | | |
| KH199-1643-04 | | 55.87 | 88.32 |
| KH199-1643-04B | 84.4 | | |
| SCAQC-1643-LC1 | 91.28 | 85.89 | 91.91 |
| SCAQC-1643-LD1 | 47.42 | 65.78 | 82.86 |
| SCAQC-1643-PB | 77.91 | 68.52 | 93.83 |

PRELIMINARY
INFORMATION



KAISER•HILL
COMPANY
ANALYTICAL SERVICES DIVISION

FAXED
8/10/99

FAX COVER SHEET FOR PRELIMINARY DATA REPORTS

RIN NUMBER: 99A8967

FROM: TOM SZYDLOWSKI

PHONE: (303) 966-8165

FAX: (303) 966-4555

TO: Wojtaszek

FAX: 4046

PHONE: _____

NUMBER OF PAGES, INCLUDING COVER SHEET: _____

Please contact _____ if the fax is not received in its entirety.
(phone number)

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Appendix 4

Radiological Survey Data for Interior and Exterior of Trailer T112C (Survey Unit C)

APPENDIX 4 - Survey Unit C (T112C)

- Survey Unit C Data Summary
- MARSSIM Calibration/Verification Worksheet
- Total and Removable Radiological Survey Results
- Performance Test Logs
- Survey Package Cover Sheet
- Sampling and Survey Instructions
- Grid Survey Map

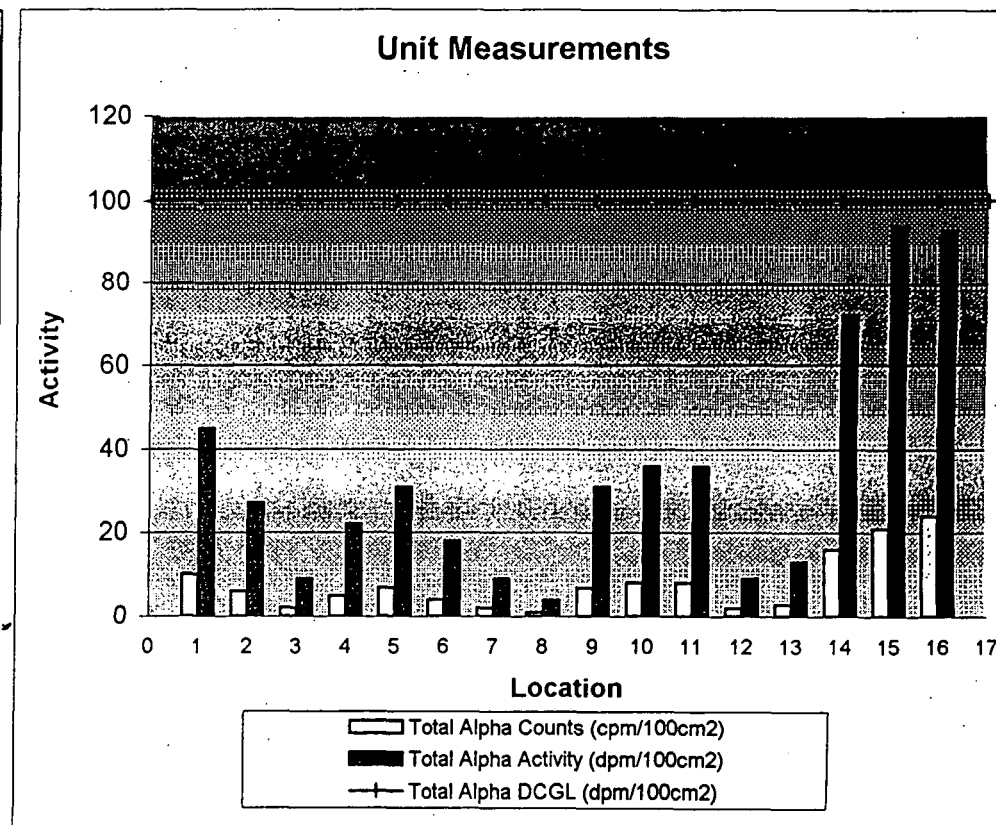
Total Alpha

Survey Unit C Data Summary - T112C

August 19, 1999

| | | | | | | |
|---------------------|----------|------|------|------------------------|---------|--------|
| | | | | 8/5/1999 | 8/19/99 | |
| standard deviation: | 28.67686 | max: | 94.0 | Instrument background: | 0 cpm | 3 cpm |
| mean: | 34.3125 | min: | 4.0 | Instrument efficiency: | 22.3 % | 22.5 % |
| median: | 29 | | | Instrument MDA: | 33 dpm | 48 dpm |

| Surface Location | | | | Grid Location | Total Alpha Counts (cpm/100cm ²) | Total Alpha Activity (dpm/100cm ²) | Total Alpha DCGL (dpm/100cm ²) |
|------------------|----------|---|-------|---------------|-------------------------------------------------|---------------------------------------------------|-----------------------------------------------|
| 1 | Room | 1 | Floor | B4 | 10 | 45 | 100 |
| 2 | Room | 1 | Floor | C2 | 6 | 27 | 100 |
| 3 | Room | 1 | Wall | D1 | 2 | 9 | 100 |
| 4 | Room | 1 | Wall | E2 | 5 | 22 | 100 |
| 5 | Room | 2 | Wall | K2 | 7 | 31 | 100 |
| 6 | Room | 3 | Wall | E1 | 4 | 18 | 100 |
| 7 | Room | 3 | Wall | J2 | 2 | 9 | 100 |
| 8 | Room | 3 | Wall | L1 | 1 | 4 | 100 |
| 9 | Room | 4 | Wall | E2 | 7 | 31 | 100 |
| 10 | Room | 5 | Wall | B2 | 8 | 36 | 100 |
| 11 | Room | 5 | Wall | H1 | 8 | 36 | 100 |
| 12 | Room | 5 | Wall | I1 | 2 | 9 | 100 |
| 13 | Room | 7 | Wall | C1 | 3 | 13 | 100 |
| 14 | Exterior | N | Wall | J3 | 16 | 72 | 100 |
| 15 | Exterior | S | Wall | G1 | 21 | 94 | 100 |
| 16 | Exterior | | Roof | M3 | 24 | 93 | 100 |



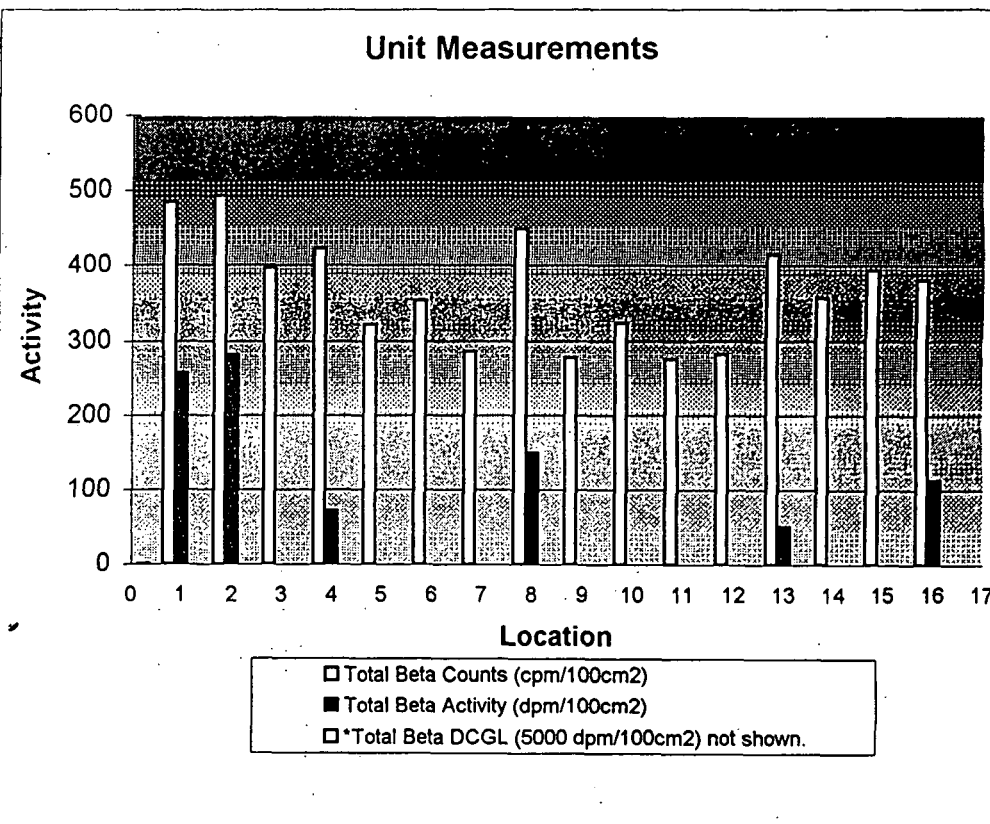
Total Beta

Survey Unit C Data Summary - T112C

August 19, 1999

| | | | | 8/5/1999 | 8/19/99 | |
|---------------------|----------|------|--------|------------------------|---------|---------|
| standard deviation: | 220.1215 | max: | 281.0 | Instrument background: | 398 cpm | 346 cpm |
| mean: | -75.8125 | min: | -364.0 | Instrument efficiency: | 33.5 % | 30.4 % |
| median: | -67 | | | Instrument MDA: | 285 dpm | 294 dpm |

| Surface Location | | | | Grid Location | Total Beta Counts (cpm/100cm ²) | Total Beta Activity (dpm/100cm ²) | Total Beta DCGL (dpm/100cm ²) |
|------------------|----------|---|-------|---------------|------------------------------------------------|--------------------------------------------------|----------------------------------------------|
| 1 | Room | 1 | Floor | B4 | 484 | 257 | 5000 |
| 2 | Room | 1 | Floor | C2 | 492 | 281 | 5000 |
| 3 | Room | 1 | Wall | D1 | 396 | -6 | 5000 |
| 4 | Room | 1 | Wall | E2 | 422 | 72 | 5000 |
| 5 | Room | 2 | Wall | K2 | 321 | -230 | 5000 |
| 6 | Room | 3 | Wall | E1 | 352 | -137 | 5000 |
| 7 | Room | 3 | Wall | J2 | 286 | -334 | 5000 |
| 8 | Room | 3 | Wall | L1 | 448 | 149 | 5000 |
| 9 | Room | 4 | Wall | E2 | 277 | -361 | 5000 |
| 10 | Room | 5 | Wall | B2 | 323 | -224 | 5000 |
| 11 | Room | 5 | Wall | H1 | 276 | -364 | 5000 |
| 12 | Room | 5 | Wall | I1 | 282 | -346 | 5000 |
| 13 | Room | 7 | Wall | C1 | 415 | 51 | 5000 |
| 14 | Exterior | N | Wall | J3 | 357 | -122 | 5000 |
| 15 | Exterior | S | Wall | G1 | 394 | -12 | 5000 |
| 16 | Exterior | | Roof | M3 | 380 | 113 | 5000 |



Removable Alpha

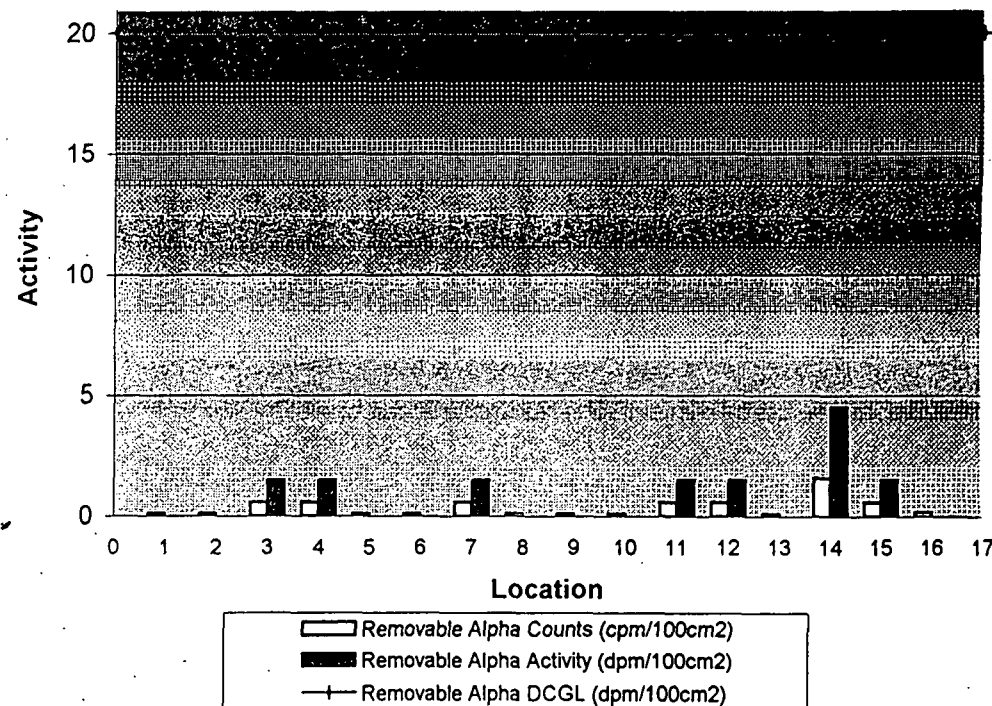
Survey Unit C Data Summary - T112C

August 19, 1999

| | | | | | | |
|---------------------|----------|------|----------|------------------------|---------|---------|
| | | | 8/5/1999 | | 8/19/99 | |
| standard deviation: | 1.220912 | max: | 4.5 | Instrument background: | 0.1 cpm | 0.2 cpm |
| mean: | 0.84375 | min: | 0.0 | Instrument efficiency: | 33 % | 33 % |
| median: | 0 | | | Instrument MDA: | 6.5 dpm | 7.5 dpm |

| Surface Location | | | | Grid Location | Removable Alpha Counts (cpm/100cm ²) | Removable Alpha Activity (dpm/100cm ²) | Removable Alpha DCGL (dpm/100cm ²) |
|------------------|----------|---|-------|---------------|-----------------------------------------------------|-------------------------------------------------------|---------------------------------------------------|
| 1 | Room | 1 | Floor | B4 | 0 | 0 | 20 |
| 2 | Room | 1 | Floor | C2 | 0 | 0 | 20 |
| 3 | Room | 1 | Wall | D1 | 1 | 1.5 | 20 |
| 4 | Room | 1 | Wall | E2 | 1 | 1.5 | 20 |
| 5 | Room | 2 | Wall | K2 | 0 | 0 | 20 |
| 6 | Room | 3 | Wall | E1 | 0 | 0 | 20 |
| 7 | Room | 3 | Wall | J2 | 1 | 1.5 | 20 |
| 8 | Room | 3 | Wall | L1 | 0 | 0 | 20 |
| 9 | Room | 4 | Wall | E2 | 0 | 0 | 20 |
| 10 | Room | 5 | Wall | B2 | 0 | 0 | 20 |
| 11 | Room | 5 | Wall | H1 | 1 | 1.5 | 20 |
| 12 | Room | 5 | Wall | I1 | 1 | 1.5 | 20 |
| 13 | Room | 7 | Wall | C1 | 0 | 0 | 20 |
| 14 | Exterior | N | Wall | J3 | 2 | 4.5 | 20 |
| 15 | Exterior | S | Wall | G1 | 1 | 1.5 | 20 |
| 16 | Exterior | | Roof | M3 | 0 | 0 | 20 |

Unit Measurements



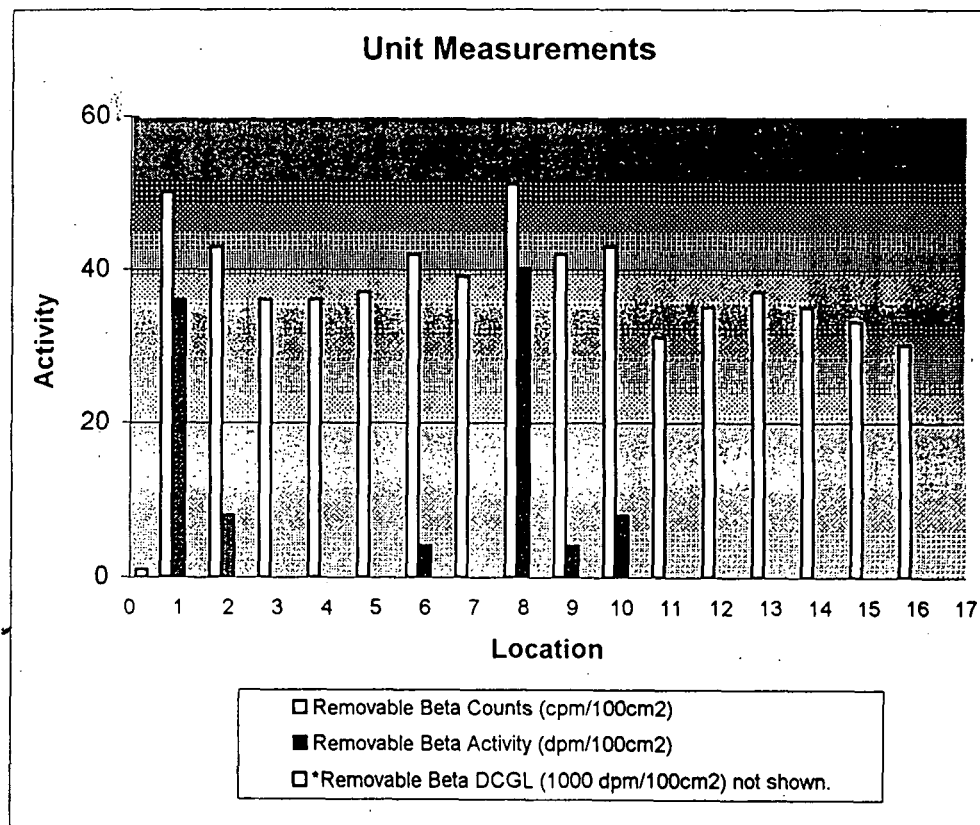
Removable Beta

Survey Unit C Data Summary - T112C

August 19, 1999

| | | | | 8/5/1999 | 8/19/99 | |
|---------------------|---------|------|-------|------------------------|---------|---------|
| standard deviation: | 23.9207 | max: | 40.0 | Instrument background: | 41 cpm | 40 cpm |
| mean: | -8.75 | min: | -40.0 | Instrument efficiency: | 25 % | 25 % |
| median: | -16 | | | Instrument MDA: | 200 dpm | 200 dpm |

| Surface Location | | | | Grid Location | Removable Beta Counts (cpm/100cm ²) | Removable Beta Activity (dpm/100cm ²) | Removable Beta DCGL (dpm/100cm ²) |
|------------------|----------|---|-------|---------------|-------------------------------------------------|---------------------------------------------------|-----------------------------------------------|
| 1 | Room | 1 | Floor | B4 | 50 | 36 | 1000 |
| 2 | Room | 1 | Floor | C2 | 43 | 8 | 1000 |
| 3 | Room | 1 | Wall | D1 | 36 | -20 | 1000 |
| 4 | Room | 1 | Wall | E2 | 36 | -20 | 1000 |
| 5 | Room | 2 | Wall | K2 | 37 | -16 | 1000 |
| 6 | Room | 3 | Wall | E1 | 42 | 4 | 1000 |
| 7 | Room | 3 | Wall | J2 | 39 | -8 | 1000 |
| 8 | Room | 3 | Wall | L1 | 51 | 40 | 1000 |
| 9 | Room | 4 | Wall | E2 | 42 | 4 | 1000 |
| 10 | Room | 5 | Wall | B2 | 43 | 8 | 1000 |
| 11 | Room | 5 | Wall | H1 | 31 | -40 | 1000 |
| 12 | Room | 5 | Wall | I1 | 35 | -24 | 1000 |
| 13 | Room | 7 | Wall | C1 | 37 | -16 | 1000 |
| 14 | Exterior | N | Wall | J3 | 35 | -24 | 1000 |
| 15 | Exterior | S | Wall | G1 | 33 | -32 | 1000 |
| 16 | Exterior | | Roof | M3 | 30 | -40 | 1000 |



Survey Area: T112**Building:** T112C**Survey Unit:** C (T112C Exterior)

Post Survey Removable Contamination Summary Statistics Calculation Verification Worksheet

Step 1:

Conduct a preliminary data review: (the mean, standard deviation, and median of the Unit C removable surface contamination data are calculated on the "Survey Unit C Data" sheet. Because all removable survey measurement results are less than DCGL_w (alpha less than 20 dpm/100 cm², beta less than 1000 dpm/100 cm²), the survey unit clearly meets the removable contamination release criterion.

Step 2:

Select the statistical tests: The one-sample sign test was selected to assess the data, with $\alpha = 0.05$ and $\beta = 0.05$. The number of sample points calculated was based on the use of this test.

The performance of the sign test was not necessary due to the fact that each individual net result was less than the DCGL_w. Thus, the sign test would result in the rejection of the null hypothesis, and conclude that the median concentration of residual radioactivity in the survey unit is less than the DCGL_w.

Step 3:

Verify the assumptions of the test: The assumed data variance, as indicated by the assumed standard deviation was verified by re-calculating the required number of smears with the ACTUAL survey unit standard deviation.

The actual removable survey standard deviations for Unit C are: α 2.38 β 23.9

Thus, the ACTUAL required number of measurements is as follows:

α :

$$\Delta/\delta = (\text{DCGL}_{\text{REMOVABLE}} - \text{LBGR}_{\text{REMOVABLE}}) / \text{SD}_{\text{REMOVABLE}}$$

$$\Delta/\delta_{\text{transuranics}} = (20 \text{ dpm}/100\text{cm}^2 - 10 \text{ dpm}/100\text{cm}^2) / 2.38 \text{ dpm}/100\text{cm}^2 = 4.2$$

β :

$$\Delta/\delta = (\text{DCGL}_{\text{REMOVABLE}} - \text{LBGR}_{\text{REMOVABLE}}) / \text{SD}_{\text{REMOVABLE}}$$

$$\Delta/\delta_{\text{transuranics}} = (1000 \text{ dpm}/100\text{cm}^2 - 500 \text{ dpm}/100\text{cm}^2) / 23.9 \text{ dpm}/100\text{cm}^2 = 20.9$$

Where:

Δ/δ is the relative shift or the resolution of measurements in units of measurement uncertainty

DCGL_{REMOVABLE} is the removable surface contamination derived concentration guideline value (DOE Order 5400.5 removable surface contamination limit equals 20 dpm/100cm² for transuranics per the T112A-C Pre Demolition Survey Plan)

LBGR_{REMOVABLE} is the lower bound of the gray region – the lower bound of the range of values of the parameter of interest in a survey unit where the consequences of making a decision error is relatively minor (set equal to value utilized in original sample size calculation).

SD_{REMOVABLE} is the ACTUAL standard deviation of the removable surface contamination measurements

Determine the Sign P value by looking up the relative shift (Δ/δ) in Table 5.4 of MARSSIM (the Sign P value is the estimated probability that a random measurement from the survey unit will be less than the DCGL when the survey unit median is actually at the LBGR). The Sign P value from Table 5.4, equals 0.998650 for a relative shift of 3.0 (The highest published value is utilized for conservatism).

Survey Area: T112**Building:** T112C**Survey Unit:** C (T112C Exterior)**Post Survey Removable Contamination Summary Statistics Calculation Verification Worksheet****Step 3: Continued**

Determine the number of removable surface contamination measurements for the applicable survey unit using the following MARSSIM, Section 5.5.2.3 formula that is based on radioactive contaminants of concern not being present in the background:

 α

$$N = (1.645 + 1.645)^2 / 4(\text{Sign } P - 0.5)^2$$

$$N = (1.645 + 1.645)^2 / 4(0.998650 - 0.5)^2 = \underline{10.9}$$

 β

$$N = (1.645 + 1.645)^2 / 4(\text{Sign } P - 0.5)^2$$

$$N = (1.645 + 1.645)^2 / 4(0.998650 - 0.5)^2 = \underline{10.9}$$

Where:

1.645 is the alpha and beta decision error value (95% confidence) per the T112A-C Pre Demolition Survey Plan

Sign P equals 0.998650

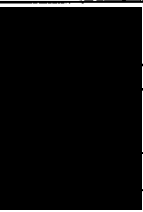

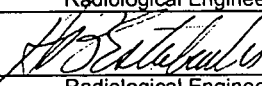
Step 4: Increase N by 20% to allow for missing or invalid data points per MARSSIM, Section 5.5.2.3.

$$N = \underline{10.9} * 1.2 = \underline{13}$$

Conclusion: Utilizing a conservative relative shift value of 3.0, a minimum of 13 α and β Removable Surface Contamination measurements were required in Unit C.

Step 4:

Draw conclusions from the data: All measurements are less than DCGL_w. The minimum number of required removable survey measurements were collected. Thus, survey Unit C complies with the removable contamination release criteria.

| | | | |
|---------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------|
| D. A. BARNES |  |  | 8-19-99 |
| Prepared By: Printed Name | | Radiological Engineer Signature | Date |
| ESTABROOKS | |  | 8/19/99 |
| Reviewed By: Printed Name | | Radiological Engineer Signature | Date |

Survey Area: T112**Building:** T112C**Survey Unit:** C (T112C Exterior)

Post Survey Total Surface Activity Summary Statistics Calculation Verification Worksheet

Step 1:

Conduct a preliminary data review: (the mean, standard deviation, and median of the Unit C data are calculated on the "Survey Unit C Data" sheet. Because all total surface activity (TSA or TSC) measurement results are less than DCGL_w (less than 100 dpm/100 cm²), the survey unit clearly meets the TSA release criterion.

A graphical data review was also performed on the attached form. The posting plot indicated that spatial trends of elevated areas are not present. The histogram indicated that no isolated areas of elevated activity are present.

Step 2:

Select the statistical tests: The one-sample sign test was selected to assess the data, with $\alpha = 0.05$ and $\beta = 0.05$. The number of sample points calculated (see "Total Surface Activity Measurement Calculation Worksheet") was based on the use of this test. A local area background (LAB) value was subtracted from each gross measurement to calculate a net result, thus the sign test applies (sign test is typically applied only when the contaminant is not present in background).

The performance of the sign test was not necessary due to the fact that each individual net result was less than the DCGL_w. Thus, the sign test would result in the rejection of the null hypothesis, and conclude that the median concentration of residual radioactivity in the survey unit is less than the DCGL_w.

Step 3:

Verify the assumptions of the test: The assumed data variance, as indicated by the assumed standard deviation was verified by re-calculating the required number of samples with the ACTUAL survey unit standard deviation.

The actual total surface contamination standard deviations for Unit C are: α 28.7 β 215

Thus, the ACTUAL required number of samples is as follows:

$$\Delta/\delta = (DCGL_{TSA} - LBGR_{TSA}) / SD_{TSA}$$

α

$$\Delta/\delta_{\text{transuranics}} = (100 \text{ dpm}/100\text{cm}^2 - 50 \text{ dpm}/100\text{cm}^2) / 28.7 \text{ dpm}/100\text{cm}^2 = 1.74$$

β

$$\Delta/\delta_{\text{transuranics}} = (5000 \text{ dpm}/100\text{cm}^2 - 2500 \text{ dpm}/100\text{cm}^2) / 215 \text{ dpm}/100\text{cm}^2 = 11.6$$

Where:

Δ/δ is the relative shift or the resolution of measurements in units of measurement uncertainty

DCGL_{TSA} is the total surface Activity derived concentration guideline value (DOE Order 5400.5 total surface Activity limit equals 100 dpm/100cm² for transuranics and 5000 dpm/100cm² for uranium, per the T112A-C Pre Demolition Survey Plan)

LBGR_{TSA} is the lower bound of the gray region – the lower bound of the range of values of the parameter of interest in a survey unit where the consequences of making a decision error is relatively minor (set equal to the value utilized in the original sample size calculation).

SD_{TSA} is the ACTUAL standard deviation of the total surface Activity

Determine the Sign P value by looking up the relative shift (Δ/δ) in Table 5.4 of MARSSIM (the Sign P value is the estimated probability that a random measurement from the survey unit will be less than the DCGL when the survey unit median is actually at the LBGR). The Sign P value from Table 5.4, equals 0.998650 for a relative shift of 3.0 (Actual value approaches one. The highest published value is utilized for conservatism).

Survey Area: T112**Building:** T112C**Survey Unit:** C (T112C Exterior)**Post Survey Total Surface Activity Summary Statistics Calculation Verification Worksheet****Step 3: Continued**

Determine the number of TSA surface Activity measurements for the applicable survey unit using the following MARSSIM, Section 5.5.2.3 formula that is based on Plutonium contaminants not being present in the background:

 α and β

$$N = (1.645 + 1.645)^2 / 4(\text{Sign } P - 0.5)^2$$

$$N = (1.645 + 1.645)^2 / 4(0.998650 - 0.5)^2 = 10.9$$

Where:

1.646 is the alpha and beta decision error value (95% confidence) per the T112A-C Pre Demolition Survey Plan

Sign P equals 0.998650

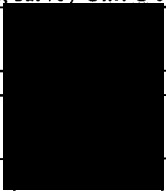
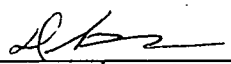
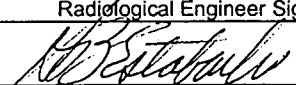
Step 4: Increase N by 20% to allow for missing or invalid data points per MARSSIM, Section 5.5.2.3.

$$N = 10.9 * 1.2 = 13$$

Conclusion: Utilizing a conservative relative shift value of 3.0, a minimum of 13 Total Surface Activity measurements were required in Unit C.

Step 4:

Draw conclusions from the data: All measurements are less than DCGL_w. The minimum number of required TSA measurements were collected. Thus, survey Unit C complies with the TSA release criteria.

| | | | |
|---------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------|
| D. A. BARNES |  |  | 8-19-99 |
| Prepared By: Printed Name | | Radiological Engineer Signature | Date |
| ES PASROOKS | |  | 8/19/99 |
| Reviewed By: Printed Name | | Radiological Engineer Signature | Date |

Building T112C Floorplan

| | | | | | |
|--------|--------|--------|--------|--------|--------|
| Room 1 | Room 2 | Room 3 | Room 4 | Room 5 | Room 6 |
| Room 7 | | | | | |

15/23
cfloorplan.xls

164

Electra Performance Test Log

| | | | | | |
|-------------------------------------------------|----------------------|-----------------------------------------------------------|-------------------|------------------------------|--|
| Instrument Serial Number <u>1827</u> | | Instrument Efficiency Alpha <u>22.3%</u> ^{22.3%} | | Beta <u>33.5%</u> | |
| Instrument Calibration Due Date <u>10-28-99</u> | | | | | |
| Source Serial Number | Calibration Due Date | Source Act. (dpm) | Source Act. (cpm) | Source Acceptable Range (sq) | |
| <u>603680141</u> | <u>N/A</u> | <u>24830</u> | <u>5537</u> | <u>4430 to 6645</u> | |
| <u>603927 B</u> | <u>N/A</u> | <u>22723</u> | <u>7612</u> | <u>6090 to 9135</u> | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

| Date | ALPHA BKGD3 | ALPHA Reading (Corrected cpm)3 | ALPHA Pass/Fail | BETA Bkgd 3 | BETA Reading (Corrected cpm)3 | BETA Pass/Fail | RCT Employee Number | RCT NAME (Print) | RCT Signature |
|---------|-------------|--------------------------------|-----------------|-------------|-------------------------------|----------------|---------------------|------------------|---------------|
| 8/13/99 | 5 | 5710 | PASS | 511 | 7066 | PASS | 572530 | W. W. Woz | [Signature] |
| 8/14/99 | 5 | 5640 | PASS | 539 | 7137 | PASS | 572530 | W. W. Woz | [Signature] |
| 8/15/99 | 4 | 5000 | PASS | 478 | 7040 | PASS | 572530 | W. W. Woz | [Signature] |
| 8/16/99 | 3 | 4860 | P | 580 | 7149 | P | 511466 | J. H. H. H. H. | [Signature] |
| 8/17/99 | 3 | 5146 | PASS | 539 | 7353 | PASS | 516740 | G. HASENKAMP | [Signature] |
| 8/18/99 | 1 | 5091 | PASS | 606 | 6723 | PASS | 516740 | G. HASENKAMP | [Signature] |
| 8/19/99 | 4 | 5040 | PASS | 597 | 6782 | PASS | 516740 | G. HASENKAMP | [Signature] |
| 8/12/99 | 3 | 5010 | PASS | 556 | 7047 | PASS | 516740 | G. HASENKAMP | [Signature] |
| 8/13/99 | 1 | 5070 | PASS | 658 | 7130 | PASS | 516740 | G. HASENKAMP | [Signature] |
| 1/1 | | | | | | | | | |
| 1/1 | | | | | | | | | |
| 1/1 | | | | | | | | | |
| 1/1 | | | | | | | | | |

1. Source activity in cpm is equal to the source activity in dpm multiplied by the efficiency.
2. Acceptable range is a + 20% (source activity in cpm multiplied by 0.8 or 1.2).
3. All counts are to be 1 minute in duration.

NOTE If the instrument will be used for alpha measurements only, the beta portion of the test log should be lined through. If the instrument will be used for beta only, then the alpha portion should be lined through.

REVIEWED BY:

L. W. Cooper

RO SUPERVISOR PRINT NAME

RO SUPERVISOR SIGNATURE

18-17-99

DATE

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

SWIPE COUNTER PERFORMANCE LOG

ALPHA ☐ BETA ☒

Calibration Due Date: 11-20-99

INSTURMENT MODEL: (Circle One)

SAC-1 BC-41 DUDLUM 2929

Counter Serial No.: BC 762

Start Date: 8/2/99

End Date: 8/8/99

Building: 549

Location: office

Source: SN 603927

D. P. M.: 22723

Certification Due Date: WLA

Shift M1
Time: _____
RCT Emp. # _____
Gross Source cpm: _____
Bkg. cpm: _____
Net Source cpm: _____
% Error: _____

(Print Name / Signature)

Shift D1
Time: 0600
RCT Emp. # [redacted]
Gross Source cpm: 5405
Bkg. cpm: 37
Net Source cpm: 5368
% Error: -5.5

(Print Name / Signature)

Shift P1
Time: _____
RCT Emp. # _____
Gross Source cpm: _____
Bkg. cpm: _____
Net Source cpm: _____
% Error: _____

(Print Name / Signature)

Shift M2
Time: _____
RCT Emp. # _____
Gross Source cpm: _____
Bkg. cpm: _____
Net Source cpm: _____
% Error: _____

(Print Name / Signature)

Shift D2
Time: 0600
RCT Emp. # [redacted]
Gross Source cpm: 5241
Bkg. cpm: 40
Net Source cpm: 5201
% Error: -8.4

(Print Name / Signature)

Shift P2
Time: _____
RCT Emp. # _____
Gross Source cpm: _____
Bkg. cpm: _____
Net Source cpm: _____
% Error: _____

(Print Name / Signature)

Shift M3
Time: _____
RCT Emp. # _____
Gross Source cpm: _____
Bkg. cpm: _____
Net Source cpm: _____
% Error: _____

(Print Name / Signature)

Shift D3
Time: 0600
RCT Emp. # [redacted]
Gross Source cpm: 5298
Bkg. cpm: 38
Net Source cpm: 5260
% Error: -7.4

(Print Name / Signature)

Shift P3
Time: _____
RCT Emp. # _____
Gross Source cpm: _____
Bkg. cpm: _____
Net Source cpm: _____
% Error: _____

(Print Name / Signature)

Shift M4
Time: _____
RCT Emp. # _____
Gross Source cpm: _____
Bkg. cpm: _____
Net Source cpm: _____
% Error: _____

(Print Name / Signature)

Shift D4
Time: 0600
RCT Emp. # [redacted]
Gross Source cpm: 5324
Bkg. cpm: 41
Net Source cpm: 5283
% Error: -7.0

(Print Name / Signature)

Shift P4
Time: _____
RCT Emp. # _____
Gross Source cpm: _____
Bkg. cpm: _____
Net Source cpm: _____
% Error: _____

(Print Name / Signature)

Shift M5
Time: _____
RCT Emp. # _____
Gross Source cpm: _____
Bkg. cpm: _____
Net Source cpm: _____
% Error: _____

(Print Name / Signature)

Shift D5
Time: 0800
RCT Emp. # [redacted]
Gross Source cpm: 5553
Bkg. cpm: 43
Net Source cpm: 5512
% Error: -3.0

(Print Name / Signature)

Shift P5
Time: _____
RCT Emp. # _____
Gross Source cpm: _____
Bkg. cpm: _____
Net Source cpm: _____
% Error: _____

(Print Name / Signature)

Shift M6
Time: _____
RCT Emp. # _____
Gross Source cpm: _____
Bkg. cpm: _____
Net Source cpm: _____
% Error: _____

(Print Name / Signature)

Shift D6
Time: _____
RCT Emp. # _____
Gross Source cpm: _____
Bkg. cpm: _____
Net Source cpm: _____
% Error: _____

(Print Name / Signature)

Shift P6
Time: _____
RCT Emp. # _____
Gross Source cpm: _____
Bkg. cpm: _____
Net Source cpm: _____
% Error: _____

(Print Name / Signature)

Shift M7
Time: _____
RCT Emp. # _____
Gross Source cpm: _____
Bkg. cpm: _____
Net Source cpm: _____
% Error: _____

(Print Name / Signature)

Shift D7
Time: _____
RCT Emp. # _____
Gross Source cpm: _____
Bkg. cpm: _____
Net Source cpm: _____
% Error: _____

(Print Name / Signature)

Shift P7
Time: _____
RCT Emp. # _____
Gross Source cpm: _____
Bkg. cpm: _____
Net Source cpm: _____
% Error: _____

(Print Name / Signature)

% ERROR = (Net cpm/E) - Source dpm x 100

Source dpm

Net cpm = gross - background cpm

E = Efficiency = 0.33 for the SAC-1 and 0.25 for the BC-4

Approved by

LW Cooper

Signature

8-10-99

Date

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

SWIPE COUNTER PERFORMANCE LOG

ALPHA ☐ BETA ☒

INSTRUMENT MODEL: (Circle One)

SAC-4/BC-4/UDLUM 2929

Counter Serial No. BC 905Calibration Due Date: 9-30-99Start Date: 8-2-99End Date: 8-8-99Building: 549Location: OfficeSource: SM 603927D. P. M.: 22723Certification Due Date: N/A

Shift M1
Time: _____
RCT Emp. # _____
Gross Source cpm: _____
Bkg. cpm: _____
Net Source cpm: _____
% Error: _____
(Print Name / Signature) _____

Shift D1
Time: 0600
RCT Emp. # _____
Gross Source cpm: 5097
Bkg. cpm: 41
Net Source cpm: 5056
% Error: -11.0
(Print Name / Signature) M. J. [Signature]

Shift P1
Time: _____
RCT Emp. # _____
Gross Source cpm: _____
Bkg. cpm: _____
Net Source cpm: _____
% Error: _____
(Print Name / Signature) _____

Shift M2
Time: _____
RCT Emp. # _____
Gross Source cpm: _____
Bkg. cpm: _____
Net Source cpm: _____
% Error: _____
(Print Name / Signature) _____

Shift D2
Time: 0600
RCT Emp. # _____
Gross Source cpm: 5015
Bkg. cpm: 39
Net Source cpm: 4976
% Error: -12.4
(Print Name / Signature) M. J. [Signature]

Shift P2
Time: _____
RCT Emp. # _____
Gross Source cpm: _____
Bkg. cpm: _____
Net Source cpm: _____
% Error: _____
(Print Name / Signature) _____

Shift M3
Time: _____
RCT Emp. # _____
Gross Source cpm: _____
Bkg. cpm: _____
Net Source cpm: _____
% Error: _____
(Print Name / Signature) _____

Shift D3
Time: 0600
RCT Emp. # _____
Gross Source cpm: 5119
Bkg. cpm: 38
Net Source cpm: 5081
% Error: -10.6
(Print Name / Signature) M. J. [Signature]

Shift P3
Time: _____
RCT Emp. # _____
Gross Source cpm: _____
Bkg. cpm: _____
Net Source cpm: _____
% Error: _____
(Print Name / Signature) _____

Shift M4
Time: _____
RCT Emp. # _____
Gross Source cpm: _____
Bkg. cpm: _____
Net Source cpm: _____
% Error: _____
(Print Name / Signature) _____

Shift D4
Time: 0600
RCT Emp. # _____
Gross Source cpm: 5092
Bkg. cpm: 41
Net Source cpm: 5051
% Error: -11.1
(Print Name / Signature) M. J. [Signature]

Shift P4
Time: _____
RCT Emp. # _____
Gross Source cpm: _____
Bkg. cpm: _____
Net Source cpm: _____
% Error: _____
(Print Name / Signature) _____

Shift M5
Time: _____
RCT Emp. # _____
Gross Source cpm: _____
Bkg. cpm: _____
Net Source cpm: _____
% Error: _____
(Print Name / Signature) _____

Shift D5
Time: 0800
RCT Emp. # _____
Gross Source cpm: 5028
Bkg. cpm: 41
Net Source cpm: 4987
% Error: -12.2
(Print Name / Signature) J. [Signature]

Shift P5
Time: _____
RCT Emp. # _____
Gross Source cpm: _____
Bkg. cpm: _____
Net Source cpm: _____
% Error: _____
(Print Name / Signature) _____

Shift M6
Time: _____
RCT Emp. # _____
Gross Source cpm: _____
Bkg. cpm: _____
Net Source cpm: _____
% Error: _____
(Print Name / Signature) _____

Shift D6
Time: _____
RCT Emp. # _____
Gross Source cpm: _____
Bkg. cpm: _____
Net Source cpm: _____
% Error: _____
(Print Name / Signature) _____

Shift P6
Time: _____
RCT Emp. # _____
Gross Source cpm: _____
Bkg. cpm: _____
Net Source cpm: _____
% Error: _____
(Print Name / Signature) _____

Shift M7
Time: _____
RCT Emp. # _____
Gross Source cpm: _____
Bkg. cpm: _____
Net Source cpm: _____
% Error: _____
(Print Name / Signature) _____

Shift D7
Time: _____
RCT Emp. # _____
Gross Source cpm: _____
Bkg. cpm: _____
Net Source cpm: _____
% Error: _____
(Print Name / Signature) _____

Shift P7
Time: _____
RCT Emp. # _____
Gross Source cpm: _____
Bkg. cpm: _____
Net Source cpm: _____
% Error: _____
(Print Name / Signature) _____

$$\% \text{ ERROR} = \frac{(\text{Net cpm} / E) - \text{Source dpm}}{\text{Source dpm}} \times 100$$

$$\text{Net cpm} = \text{gross} - \text{background cpm}$$

E = Efficiency = 0.33 for the SAC-4 and 0.25 for the BC-4

Approved by

LN Cooper

Signature

L. Loope8-10-99
Date

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

SWIPE COUNTER PERFORMANCE LOG

ALPHA ☒ BETA ☐

INSTRUMENT MODEL: (Circle One)

SAC-4/BC-4/LUDLUM 2929

Counter Serial No. 835

Calibration Due Date: 10-26-99

Start Date: 8-2-99

End Date: 8-8-99

Building: 549

Location: office

Source: SN 680141

D. P. M.: 24830

Certification Due Date: N/A

Shift M1 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____

(Print Name / Signature)

Shift D1 Gross Source cpm: 7372
 Time: 6:00 Bkg. cpm: 0.2
 RCT Emp. # _____ Net Source cpm: 7372
 % Error: -10.0

(Print Name / Signature)

Shift P1 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____

(Print Name / Signature)

Shift M2 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____

(Print Name / Signature)

Shift D2 Gross Source cpm: 7193
 Time: 6:00 Bkg. cpm: 0.0
 RCT Emp. # _____ Net Source cpm: 7193
 % Error: -12.2

(Print Name / Signature)

Shift P2 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____

(Print Name / Signature)

Shift M3 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____

(Print Name / Signature)

Shift D3 Gross Source cpm: 7224
 Time: 6:00 Bkg. cpm: 0.0
 RCT Emp. # _____ Net Source cpm: 7224
 % Error: -11.8

(Print Name / Signature)

Shift P3 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____

(Print Name / Signature)

Shift M4 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____

(Print Name / Signature)

Shift D4 Gross Source cpm: 7290
 Time: 6:00 Bkg. cpm: 0.1
 RCT Emp. # _____ Net Source cpm: 7290
 % Error: -11.0

(Print Name / Signature)

Shift P4 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____

(Print Name / Signature)

Shift M5 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____

(Print Name / Signature)

Shift D5 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____

(Print Name / Signature)

Shift P5 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____

(Print Name / Signature)

Shift M6 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____

(Print Name / Signature)

Shift D6 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____

(Print Name / Signature)

Shift P6 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____

(Print Name / Signature)

Shift M7 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____

(Print Name / Signature)

Shift D7 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____

(Print Name / Signature)

Shift P7 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 % Error: _____

(Print Name / Signature)

$$\% \text{ ERROR} = \frac{(\text{Net cpm} / E) - \text{Source dpm}}{\text{Source dpm}} \times 100$$

Source dpm
 Net cpm = gross - background cpm

E = Efficiency = 0.33 for the SAC-4 and 0.25 for the BC-4

Approved by

LN Cooper

Signature

8-10-99
Date

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

SWIPE COUNTER PERFORMANCE LOG

ALPHA ☒ BETA ☐

INSTRUMENT MODEL: (Circle One)

SAC-1 / BC-4 / LUDLUM 2929

Counter Serial No.

824

Calibration Due Date: 10-13-99

Start Date: 8-9-99

End Date: 8-15-99

Building: 549

Location: OFFICE

Source: SN 68014

D. P. M.: 24830

Certification Due Date:

Shift M1 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 _____ % Error: _____
 (Print Name / Signature)

Shift O1 Gross Source cpm: 7590
 Time: 0630 Bkg. cpm: 0.1
 RCT Emp. # _____ Net Source cpm: 7590
 JASEN [Signature] % Error: -8.9
 (Print Name / Signature)

Shift P1 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 _____ % Error: _____
 (Print Name / Signature)

Shift M2 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 _____ % Error: _____
 (Print Name / Signature)

Shift D2 Gross Source cpm: 7803
 Time: 0630 Bkg. cpm: 0.3
 RCT Emp. # _____ Net Source cpm: 7803
 JASEN [Signature] % Error: -11.6
 (Print Name / Signature)

Shift P2 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 _____ % Error: _____
 (Print Name / Signature)

Shift M3 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 _____ % Error: _____
 (Print Name / Signature)

Shift D3 Gross Source cpm: 7437
 Time: 0630 Bkg. cpm: 0.1
 RCT Emp. # _____ Net Source cpm: 7437
 JASEN [Signature] % Error: -4.2
 (Print Name / Signature)

Shift P3 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 _____ % Error: _____
 (Print Name / Signature)

Shift M4 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 _____ % Error: _____
 (Print Name / Signature)

Shift D4 Gross Source cpm: 7708
 Time: 0630 Bkg. cpm: 0.3
 RCT Emp. # _____ Net Source cpm: 7708
 JASEN [Signature] % Error: -5.9
 (Print Name / Signature)

Shift P4 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 _____ % Error: _____
 (Print Name / Signature)

Shift M5 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 _____ % Error: _____
 (Print Name / Signature)

Shift D5 Gross Source cpm: 7681
 Time: 0630 Bkg. cpm: 0.1
 RCT Emp. # _____ Net Source cpm: 7681
 JASEN [Signature] % Error: -6.2
 (Print Name / Signature)

Shift P5 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 _____ % Error: _____
 (Print Name / Signature)

Shift M6 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 _____ % Error: _____
 (Print Name / Signature)

Shift D6 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 _____ % Error: _____
 (Print Name / Signature)

Shift P6 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 _____ % Error: _____
 (Print Name / Signature)

Shift M7 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 _____ % Error: _____
 (Print Name / Signature)

Shift D7 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 _____ % Error: _____
 (Print Name / Signature)

Shift P7 Gross Source cpm: _____
 Time: _____ Bkg. cpm: _____
 RCT Emp. # _____ Net Source cpm: _____
 _____ % Error: _____
 (Print Name / Signature)

$$\% \text{ ERROR} = \frac{(\text{Net cpm}/E) - \text{Source dpm}}{\text{Source dpm}} \times 100$$

$$\text{Net cpm} = \text{gross} - \text{background cpm}$$

E = Efficiency = 0.33 for the SAC-1 and 0.25 for the BC-4

Approved by

W Cooper

Signature

Date

8-17-99

Survey Type CONTAMINATION SURVEY

Building: T112 A,B & C

Location: **280 Yard**

Purpose: Resurvey per R.E. (MARSSIM Survey)

RWP #: N/A

Date: 08-19-99 Time: 11:00

RCT: Hersey /
 Print name Signature

RCT: N/A /
Print name Signature Emp. #

PRL #:

Comments:

Alpha removable was a two minute count.

SURVEY RESULTS

Date Reviewed: _____ RS Supervision: _____

 Print Name Signature Emp. #

COVER SHEET

| | removable | | total | |
|----|-----------|------|--------|------|
| | counts | | counts | |
| | alpha | beta | alpha | beta |
| 1 | 6 | 34 | 24 | 346 |
| 2 | 2 | 29 | 37 | 389 |
| 3 | 0 | 33 | 16 | 354 |
| 4 | 7 | 44 | 9 | 346 |
| 5 | 3 | 29 | 15 | 333 |
| 6 | 0 | 45 | 20 | 325 |
| 7 | | | | |
| 8 | | | | |
| 9 | | | | |
| 10 | | | | |
| 11 | | | | |
| 12 | | | | |
| 13 | | | | |
| 14 | | | | |
| 15 | | | | |
| 16 | | | | |
| 17 | | | | |
| 18 | | | | |
| 19 | | | | |
| 20 | | | | |
| 21 | | | 19 | 352 |
| 22 | | | 32 | 382 |
| 23 | | | 13 | 342 |
| 24 | | | 17 | 375 |
| 25 | | | | |
| 26 | | | | |
| 27 | | | | |
| 28 | | | | |
| 29 | | | | |
| 30 | | | | |
| 31 | | | | |
| 32 | | | | |
| 33 | | | | |
| 34 | | | | |
| 35 | | | | |
| 36 | | | | |
| 37 | | | | |
| 38 | | | | |
| 39 | | | | |
| 40 | | | | |

INFORMATION ONLY

Survey Type CONTAMINATION SURVEY

| | |
|-----------|------------------------------------|
| Building: | T112 A,B & C |
| Location: | 280 Yard |
| Purpose: | Resurvey per R.E. (MARSSIM Survey) |

RWP #: : **N/A**

Date: 08-19-99 Time: 11:00

RCT: Hersey 1/1/82 [Redacted]
Print name Signature Emp. #

RCT: N/A / /
 Print name Signature Emp. #

| Mfg. | Eberline | Mfg. | Eberline | Mfg. | NEtech |
|------------|----------|------------|----------|------------|---------------|
| Model | BC-4 | Model | BC-4 | Model | Electra |
| Serial# | 700 | Serial# | 770 | Serial# | 1665 |
| Cal Due | 10/22/99 | Cal Due | 1/7/00 | Cal Due | 9/19/99 |
| Bkg. | 40 cpm | Bkg. | 37 cpm | Bkg. | 3 346 cpm |
| Efficiency | 25 % | Efficiency | 25 % | Efficiency | 22.5 30.4 % |
| MDA | 200 dpm | MDA | 200 dpm | MDA | 48 294 dpm |

PRL #:

Comments:

Alpha removable was a two minute count.

SURVEY RESULTS

[illegible]

ate Reviewed: 8/18/98 RS Supervision: S. Enclbank

Print Name _____

Signature _____

AUG-18-53 THU 13:11 KAD SHEET

FAX NO. 303 300 2002

- R. U.S.

RO SUPERVISOR

RO SUPERVISOR PRINT NAME

RO SUPERV
Hooper

RO SUPERVISOR SIGNATURE

DATE _____

NOTE If the instrument will be used for alpha measurements only, the beta portion of the test log should be lined through. If the instrument will be used for beta only, then the alpha portion should be lined through.

174

RS FORMS 02.01-03

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

SWIPE COUNTER PERFORMANCE LOG

| | | | | | |
|--------------------------------------------------------------------------------------------|--|--------------------------------------------------------------------------------------------------------------|--|-----------------------------------------------------------------------------------------------------------|--|
| INSTRUMENT MODEL: (Circle One) SAC-4 / BC-4 / PLUDLUM 2929 | | Counter Serial No.: <u>Rc 770</u> | | ALPHA <input type="checkbox"/> BETA <input checked="" type="checkbox"/> | |
| Start Date: <u>8-16-99</u> | | End Date: <u>8-22-99</u> | | Calibration Due Date: <u>1-7-00</u> | |
| Source: <u>SM 603927</u> | | D. P. M.: <u>22723</u> | | Building: <u>549</u> | |
| | | | | Location: <u>office</u> | |
| | | | | Certification Due Date: <u>N/A</u> | |
| Shift A1 Time: _____ RCT Emp. # _____ (Print Name / Signature) _____ | | Gross Source cpm: _____ Bkg. cpm: _____ Net Source cpm: _____ % Error: _____ | | Shift P1 Time: _____ RCT Emp. # _____ (Print Name / Signature) _____ | |
| | | | | Gross Source cpm: _____ Bkg. cpm: _____ Net Source cpm: _____ % Error: _____ | |
| Shift D1 Time: <u>0600</u> RCT Emp. # _____ (Print Name / Signature) _____ | | Gross Source cpm: <u>5112</u> Bkg. cpm: <u>38</u> Net Source cpm: <u>5074</u> % Error: <u>-10.7</u> | | Shift M5 Time: _____ RCT Emp. # _____ (Print Name / Signature) _____ | |
| | | | | Gross Source cpm: _____ Bkg. cpm: _____ Net Source cpm: _____ % Error: _____ | |
| Shift P1 Time: _____ RCT Emp. # _____ (Print Name / Signature) _____ | | Gross Source cpm: _____ Bkg. cpm: _____ Net Source cpm: _____ % Error: _____ | | Shift D5 Time: <u>04X NO 303 968 2008</u> RCT Emp. # _____ (Print Name / Signature) _____ | |
| | | | | Gross Source cpm: _____ Bkg. cpm: _____ Net Source cpm: _____ % Error: _____ | |
| Shift M2 Time: _____ RCT Emp. # _____ (Print Name / Signature) _____ | | Gross Source cpm: _____ Bkg. cpm: _____ Net Source cpm: _____ % Error: _____ | | Shift P5 Time: _____ RCT Emp. # _____ (Print Name / Signature) _____ | |
| | | | | Gross Source cpm: _____ Bkg. cpm: _____ Net Source cpm: _____ % Error: _____ | |
| Shift D1 Time: <u>0600</u> RCT Emp. # _____ (Print Name / Signature) _____ | | Gross Source cpm: <u>5141</u> Bkg. cpm: <u>37</u> Net Source cpm: <u>5104</u> % Error: <u>-9.2</u> | | Shift M6 Time: _____ RCT Emp. # _____ (Print Name / Signature) _____ | |
| | | | | Gross Source cpm: _____ Bkg. cpm: _____ Net Source cpm: _____ % Error: _____ | |
| Shift P2 Time: _____ RCT Emp. # _____ (Print Name / Signature) _____ | | Gross Source cpm: _____ Bkg. cpm: _____ Net Source cpm: _____ % Error: _____ | | Shift D6 Time: _____ RCT Emp. # _____ (Print Name / Signature) _____ | |
| | | | | Gross Source cpm: _____ Bkg. cpm: _____ Net Source cpm: _____ % Error: _____ | |
| Shift M3 Time: _____ RCT Emp. # _____ (Print Name / Signature) _____ | | Gross Source cpm: _____ Bkg. cpm: _____ Net Source cpm: _____ % Error: _____ | | Shift P6 Time: _____ RCT Emp. # _____ (Print Name / Signature) _____ | |
| | | | | Gross Source cpm: _____ Bkg. cpm: _____ Net Source cpm: _____ % Error: _____ | |
| Shift D3 Time: <u>0600</u> RCT Emp. # _____ (Print Name / Signature) _____ | | Gross Source cpm: <u>5058</u> Bkg. cpm: <u>37</u> Net Source cpm: <u>5021</u> % Error: <u>-11.6</u> | | Shift M7 Time: _____ RCT Emp. # _____ (Print Name / Signature) _____ | |
| | | | | Gross Source cpm: _____ Bkg. cpm: _____ Net Source cpm: _____ % Error: _____ | |
| Shift P3 Time: _____ RCT Emp. # _____ (Print Name / Signature) _____ | | Gross Source cpm: _____ Bkg. cpm: _____ Net Source cpm: _____ % Error: _____ | | Shift D7 Time: _____ RCT Emp. # _____ (Print Name / Signature) _____ | |
| | | | | Gross Source cpm: _____ Bkg. cpm: _____ Net Source cpm: _____ % Error: _____ | |
| Shift M4 Time: _____ RCT Emp. # _____ (Print Name / Signature) _____ | | Gross Source cpm: _____ Bkg. cpm: _____ Net Source cpm: _____ % Error: _____ | | Shift P7 Time: _____ RCT Emp. # _____ (Print Name / Signature) _____ | |
| | | | | Gross Source cpm: _____ Bkg. cpm: _____ Net Source cpm: _____ % Error: _____ | |
| Shift D4 Time: <u>0600</u> RCT Emp. # _____ (Print Name / Signature) _____ | | Gross Source cpm: <u>5204</u> Bkg. cpm: <u>37</u> Net Source cpm: <u>5167</u> % Error: <u>-9.0</u> | | | |
| | | | | | |

COPY

% ERROR = $\frac{(\text{Net cpm} / E) - \text{Source dpm}}{\text{Source dpm}} \times 100$
Net cpm = gross - background cpm

E = Efficiency = 0.33 for the SAC-4 and 0.35 for the BC-4

Approved by: LN Cooper , L. Cooper , [Redacted] 18/9-99
Date

RS FORMS 02.01-03

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

SWIPE COUNTER PERFORMANCE LOG

INSTRUMENT MODEL: (Circle One)

ALPHA ☐BETA ☒

SAC 4 / BC 4 DUOLUM 2929

Counter Serial No. 82700Calibration Due Date: 10-22-99Start Date: 8-16-99End Date: 8-22-99Building: 549Location: 0664Source: SN 603927D. P. M.: 22723Certification Due Date: WIA

Shift M1
Time: _____
RCT Emp. # _____
Gross Source cpm: _____
Bkg. cpm: _____
Net Source cpm: _____
% Error: _____
(Print Name / Signature)

Shift P1
Time: _____
RCT Emp. # _____
Gross Source cpm: _____
Bkg. cpm: _____
Net Source cpm: _____
% Error: _____
(Print Name / Signature)

Shift D1
Time: 0600
RCT Emp. # [REDACTED]
Gross Source cpm: 5282
Bkg. cpm: 5241
Net Source cpm: 5241
% Error: -7.7
(Print Name / Signature) [Signature]

Shift M5
Time: _____
RCT Emp. # _____
Gross Source cpm: _____
Bkg. cpm: _____
Net Source cpm: _____
% Error: _____
(Print Name / Signature)

Shift P1
Time: _____
RCT Emp. # _____
Gross Source cpm: _____
Bkg. cpm: 1.4
Net Source cpm: _____
% Error: _____
(Print Name / Signature)

Shift D5
Time: 0600
RCT Emp. # 303
Gross Source cpm: _____
Bkg. cpm: _____
Net Source cpm: _____
% Error: _____
(Print Name / Signature)

Shift M2
Time: _____
RCT Emp. # _____
Gross Source cpm: _____
Bkg. cpm: _____
Net Source cpm: _____
% Error: _____
(Print Name / Signature)

Shift P5
Time: _____
RCT Emp. # _____
Gross Source cpm: _____
Bkg. cpm: _____
Net Source cpm: _____
% Error: _____
(Print Name / Signature)

Shift D2
Time: 0600
RCT Emp. # [REDACTED]
Gross Source cpm: 5262
Bkg. cpm: 5223
Net Source cpm: 5223
% Error: -8.1
(Print Name / Signature) [Signature]

Shift M6
Time: _____
RCT Emp. # _____
Gross Source cpm: _____
Bkg. cpm: _____
Net Source cpm: _____
% Error: _____
(Print Name / Signature)

Shift P2
Time: _____
RCT Emp. # _____
Gross Source cpm: _____
Bkg. cpm: _____
Net Source cpm: _____
% Error: _____
(Print Name / Signature)

Shift D6
Time: _____
RCT Emp. # _____
Gross Source cpm: _____
Bkg. cpm: _____
Net Source cpm: _____
% Error: _____
(Print Name / Signature)

Shift M3
Time: _____
RCT Emp. # _____
Gross Source cpm: _____
Bkg. cpm: _____
Net Source cpm: _____
% Error: _____
(Print Name / Signature)

Shift P6
Time: _____
RCT Emp. # _____
Gross Source cpm: _____
Bkg. cpm: _____
Net Source cpm: _____
% Error: _____
(Print Name / Signature)

Shift D3
Time: 0600
RCT Emp. # [REDACTED]
Gross Source cpm: 5237
Bkg. cpm: 5241
Net Source cpm: 5241
% Error: -8.5
(Print Name / Signature) [Signature]

Shift M7
Time: _____
RCT Emp. # _____
Gross Source cpm: _____
Bkg. cpm: _____
Net Source cpm: _____
% Error: _____
(Print Name / Signature)

Shift P3
Time: _____
RCT Emp. # _____
Gross Source cpm: _____
Bkg. cpm: _____
Net Source cpm: _____
% Error: _____
(Print Name / Signature)

Shift D7
Time: _____
RCT Emp. # _____
Gross Source cpm: _____
Bkg. cpm: _____
Net Source cpm: _____
% Error: _____
(Print Name / Signature)

Shift M4
Time: _____
RCT Emp. # _____
Gross Source cpm: _____
Bkg. cpm: _____
Net Source cpm: _____
% Error: _____
(Print Name / Signature)

Shift P7
Time: _____
RCT Emp. # _____
Gross Source cpm: _____
Bkg. cpm: _____
Net Source cpm: _____
% Error: _____
(Print Name / Signature)

Shift D4
Time: _____
RCT Emp. # [REDACTED]
Gross Source cpm: 5235
Bkg. cpm: 5213
Net Source cpm: 5213
% Error: -8.2
(Print Name / Signature) [Signature]

% ERROR = $\frac{(\text{Net cpm} / E) - \text{Source dpm}}{\text{Source dpm}} \times 100$
Net cpm = gross - background cpm

E = Efficiency (0.3) for the SAC and 0.25 for the BC-4

Approved by : CN Cooper

Signature

Date

18-19-99

RS FORMS 02.01-03

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

SWIPE COUNTER PERFORMANCE LOG

INSTRUMENT MODEL: (Circle One) SAC-4/BC-4/LUDLUM 2929 Counter Serial No. B24 ALPHA ☒ BETA ☐
 Start Date: 8-16-99 End Date: 8-22-99 Building: 549 Calibration Due Date: 10-13-99
 Source: SIN 680171 D. P. M.: 24830 Certification Due Date: w/la

| | | | |
|--------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| Shift A1 Time: _____ RCT Emp. # _____ (Print Name / Signature) _____ | Gross Source cpm: _____ Bkg. cpm: _____ Net Source cpm: _____ % Error: _____ | Shift P1 Time: _____ RCT Emp. # _____ (Print Name / Signature) _____ | Gross Source cpm: _____ Bkg. cpm: _____ Net Source cpm: _____ % Error: _____ |
| Shift D1 Time: <u>0600</u> RCT Emp. # <u>[redacted]</u> (Print Name / Signature) <u>[signature]</u> | Gross Source cpm: <u>7479</u> Bkg. cpm: <u>0.0</u> Net Source cpm: <u>7479</u> % Error: <u>-8.7</u> | Shift M5 Time: _____ RCT Emp. # _____ (Print Name / Signature) _____ | Gross Source cpm: _____ Bkg. cpm: _____ Net Source cpm: _____ % Error: _____ |
| Shift P1 Time: _____ RCT Emp. # _____ (Print Name / Signature) _____ | Gross Source cpm: _____ Bkg. cpm: <u>CTV</u> Net Source cpm: _____ % Error: _____ | Shift D5 Time: <u>MAX NO 303 900 2002</u> RCT Emp. # _____ (Print Name / Signature) _____ | Gross Source cpm: _____ Bkg. cpm: _____ Net Source cpm: _____ % Error: _____ |
| Shift M2 Time: _____ RCT Emp. # _____ (Print Name / Signature) _____ | Gross Source cpm: _____ Bkg. cpm: _____ Net Source cpm: _____ % Error: _____ | Shift P5 Time: _____ RCT Emp. # _____ (Print Name / Signature) _____ | Gross Source cpm: _____ Bkg. cpm: _____ Net Source cpm: _____ % Error: _____ |
| Shift D2 Time: <u>0600</u> RCT Emp. # <u>[redacted]</u> (Print Name / Signature) <u>[signature]</u> | Gross Source cpm: <u>7293</u> Bkg. cpm: <u>0.1</u> Net Source cpm: <u>7293</u> % Error: <u>-11.0</u> | Shift M6 Time: _____ RCT Emp. # _____ (Print Name / Signature) _____ | Gross Source cpm: _____ Bkg. cpm: _____ Net Source cpm: _____ % Error: _____ |
| Shift P2 Time: _____ RCT Emp. # _____ (Print Name / Signature) _____ | Gross Source cpm: _____ Bkg. cpm: _____ Net Source cpm: _____ % Error: _____ | Shift D6 Time: _____ RCT Emp. # _____ (Print Name / Signature) _____ | Gross Source cpm: _____ Bkg. cpm: _____ Net Source cpm: _____ % Error: _____ |
| Shift M3 Time: _____ RCT Emp. # _____ (Print Name / Signature) _____ | Gross Source cpm: _____ Bkg. cpm: _____ Net Source cpm: _____ % Error: _____ | Shift P6 Time: _____ RCT Emp. # _____ (Print Name / Signature) _____ | Gross Source cpm: _____ Bkg. cpm: _____ Net Source cpm: _____ % Error: _____ |
| Shift D3 Time: <u>0600</u> RCT Emp. # <u>[redacted]</u> (Print Name / Signature) <u>[signature]</u> | Gross Source cpm: <u>7497</u> Bkg. cpm: <u>0.2</u> Net Source cpm: <u>7497</u> % Error: <u>-8.5</u> | Shift M7 Time: _____ RCT Emp. # _____ (Print Name / Signature) _____ | Gross Source cpm: _____ Bkg. cpm: _____ Net Source cpm: _____ % Error: _____ |
| Shift P3 Time: _____ RCT Emp. # _____ (Print Name / Signature) _____ | Gross Source cpm: _____ Bkg. cpm: _____ Net Source cpm: _____ % Error: _____ | Shift D7 Time: _____ RCT Emp. # _____ (Print Name / Signature) _____ | Gross Source cpm: _____ Bkg. cpm: _____ Net Source cpm: _____ % Error: _____ |
| Shift M4 Time: _____ RCT Emp. # _____ (Print Name / Signature) _____ | Gross Source cpm: _____ Bkg. cpm: _____ Net Source cpm: _____ % Error: _____ | Shift P7 Time: _____ RCT Emp. # _____ (Print Name / Signature) _____ | Gross Source cpm: _____ Bkg. cpm: _____ Net Source cpm: _____ % Error: _____ |
| Shift D4 Time: <u>0600</u> RCT Emp. # <u>[redacted]</u> (Print Name / Signature) <u>[signature]</u> | Gross Source cpm: <u>7516</u> Bkg. cpm: <u>0.2</u> Net Source cpm: <u>7516</u> % Error: <u>-7.5</u> | $\% \text{ ERROR} = \frac{(\text{Net cpm}/E) - \text{Source dpm}}{\text{Source dpm}} \times 100$ <p>Net cpm = gross - background cpm</p> | |

E = Efficiency = 0.33 for the SAC-4 and 0.25 for the BC-4

Approved by

CNC Cooper

Signature

Date

8-19-99

RS FORMS 02.01-03

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

SWIPE COUNTER PERFORMANCE LOG

INSTRUMENT MODEL: (Circle One) SAC-4/BC-4/LUDLUM 2929 Counter Serial No. 835 ALPHA ☒ BETA ☐
 Start Date: 8-16-99 End Date: 8-22-99 Building: 549 Calibration Due Date: 10-26-99
 Source: SN 680141 D. P. M.: 24830 Certification Due Date: N/A

| | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Shift A1 Time: _____ RCT Emp. # _____ Gross Source cpm: _____ Bkg. cpm: _____ Net Source cpm: _____ % Error: _____ (Print Name / Signature) _____ | Shift P4 Time: _____ RCT Emp. # _____ Gross Source cpm: _____ Bkg. cpm: _____ Net Source cpm: _____ % Error: _____ (Print Name / Signature) _____ |
| Shift O1 Time: <u>0600</u> RCT Emp. # <u>[redacted]</u> Gross Source cpm: <u>7060</u> Bkg. cpm: <u>0.1</u> Net Source cpm: <u>7060</u> % Error: <u>-13.8</u> (Print Name / Signature) <u>W. Cooper</u> | Shift M5 Time: _____ RCT Emp. # _____ Gross Source cpm: _____ Bkg. cpm: _____ Net Source cpm: _____ % Error: _____ (Print Name / Signature) _____ |
| Shift P1 Time: _____ RCT Emp. # _____ Gross Source cpm: _____ Bkg. cpm: _____ Net Source cpm: _____ % Error: _____ (Print Name / Signature) _____ | Shift D5 Time: <u>FAV NO 202 988 20</u> RCT Emp. # _____ Gross Source cpm: _____ Bkg. cpm: _____ Net Source cpm: _____ % Error: _____ (Print Name / Signature) _____ |
| Shift M2 Time: _____ RCT Emp. # _____ Gross Source cpm: _____ Bkg. cpm: _____ Net Source cpm: _____ % Error: _____ (Print Name / Signature) _____ | Shift P5 Time: _____ RCT Emp. # _____ Gross Source cpm: _____ Bkg. cpm: _____ Net Source cpm: _____ % Error: _____ (Print Name / Signature) _____ |
| Shift O2 Time: <u>0600</u> RCT Emp. # <u>[redacted]</u> Gross Source cpm: <u>7168</u> Bkg. cpm: <u>0.8</u> Net Source cpm: <u>7168</u> % Error: <u>-13.3</u> (Print Name / Signature) <u>W. Cooper</u> | Shift M6 Time: _____ RCT Emp. # _____ Gross Source cpm: _____ Bkg. cpm: _____ Net Source cpm: _____ % Error: _____ (Print Name / Signature) _____ |
| Shift P2 Time: _____ RCT Emp. # _____ Gross Source cpm: _____ Bkg. cpm: _____ Net Source cpm: _____ % Error: _____ (Print Name / Signature) _____ | Shift D6 Time: _____ RCT Emp. # _____ Gross Source cpm: _____ Bkg. cpm: _____ Net Source cpm: _____ % Error: _____ (Print Name / Signature) _____ |
| Shift M3 Time: _____ RCT Emp. # _____ Gross Source cpm: _____ Bkg. cpm: _____ Net Source cpm: _____ % Error: _____ (Print Name / Signature) _____ | Shift P6 Time: _____ RCT Emp. # _____ Gross Source cpm: _____ Bkg. cpm: _____ Net Source cpm: _____ % Error: _____ (Print Name / Signature) _____ |
| Shift O3 Time: <u>0600</u> RCT Emp. # <u>[redacted]</u> Gross Source cpm: <u>7254</u> Bkg. cpm: <u>0.2</u> Net Source cpm: <u>7254</u> % Error: <u>-11.5</u> (Print Name / Signature) <u>W. Cooper</u> | Shift M7 Time: _____ RCT Emp. # _____ Gross Source cpm: _____ Bkg. cpm: _____ Net Source cpm: _____ % Error: _____ (Print Name / Signature) _____ |
| Shift P3 Time: _____ RCT Emp. # _____ Gross Source cpm: _____ Bkg. cpm: _____ Net Source cpm: _____ % Error: _____ (Print Name / Signature) _____ | Shift D7 Time: _____ RCT Emp. # _____ Gross Source cpm: _____ Bkg. cpm: _____ Net Source cpm: _____ % Error: _____ (Print Name / Signature) _____ |
| Shift A4 Time: _____ RCT Emp. # _____ Gross Source cpm: _____ Bkg. cpm: _____ Net Source cpm: _____ % Error: _____ (Print Name / Signature) _____ | Shift P7 Time: _____ RCT Emp. # _____ Gross Source cpm: _____ Bkg. cpm: _____ Net Source cpm: _____ % Error: _____ (Print Name / Signature) _____ |
| Shift O4 Time: <u>0600</u> RCT Emp. # <u>[redacted]</u> Gross Source cpm: <u>6973</u> Bkg. cpm: <u>0.1</u> Net Source cpm: <u>6973</u> % Error: <u>-14.9</u> (Print Name / Signature) <u>W. Cooper</u> | $\% \text{ ERROR} = (\text{Net cpm} / \text{E}) - \text{Source dpm} \times 100$ $\text{Source dpm} = \text{Net cpm} - \text{gross - background cpm}$ |

E = Efficiency (0.33 for the SAC-4 and 0.25 for the BC-4)

Approved by

C. N. Cooper

W. Cooper

Emp. #

Date

10-19-99

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

INSTRUMENT DATA

Mfg. Eberline Mfg. Eberline Mfg. _____
 Model SAC-4 Model SAC-4 Model _____
 Serial# 835 Serial# 824 Serial# _____
 Cal Due 10/26/99 Cal Due 10/13/99 Cal Due _____
 Bkg. 0.1 cpm Bkg. 0.0 cpm Bkg. _____
 Efficiency 33 % Efficiency 33 % Efficiency _____
 MDA 6.5 dpm MDA 6.5 dpm MDA _____

Mfg. Eberline Mfg. Eberline Mfg. _____
 Model BC-4 Model BC-4 Model _____
 Serial# 700 Serial# 770 Serial# _____
 Cal Due 10/22/99 Cal Due 1/7/00 Cal Due _____
 Bkg. 41 cpm Bkg. 38 cpm Bkg. _____ cpm
 Efficiency 25 % Efficiency 25 % Efficiency _____ %
 MDA 200 dpm MDA 200 dpm MDA ### ### dpm

Survey Type **QA SWIPE SURVEY**Building: **T112 A, B & C**Location: **280 Yard**Purpose: **MARSSIM Release Survey**RWP #: **N/A**Date: **08-16-99** Time: **14:00**

RCT: **Hersey** / **[REDACTED]**
 Print name Signature

RCT: **Espinoza** / **[REDACTED]**
 Print name Signature Emp. #

PRL #: _____

Comments: _____

Alpha removable was a two minute count.

SURVEY RESULTS

| Vibe | Location/Description (Results in DPM/100CM ²) | Removable | | Total | | Swipe # | Location/Description (Results in DPM/100CM ²) | Removable | | Total | |
|------|--------------------------------------------------------------|-----------|------|-------|------|---------|--------------------------------------------------------------|-----------|------|-------|------|
| | | Alpha | Beta | Alpha | Beta | | | Alpha | Beta | Alpha | Beta |
| 1 | T112A ROOM 4 WALL A6* | 1.5 | -12 | | | 21 | | | | | |
| 2 | T112A ROOM 6 FLOOR A1* | 1.5 | -20 | | | 22 | | | | | |
| 3 | T112A ROOM 8 WALL P2* | 0.0 | 4 | | | 223 | | | | | |
| 4 | T112A ROOM 9 FLOOR A3* | 0.0 | -36 | | | 24 | | | | | |
| 5 | T112A ROOM 11 WALL K1* | 0.0 | -32 | | | 25 | | | | | |
| 6 | T112A EXTERIOR WEST WALL B1* | 0.0 | -28 | | | 26 | | | | | |
| 7 | T112A EXTERIOR NORTH WALL A1* | 0.0 | 0 | | | 27 | | | | | |
| 8 | T112A EXTERIOR EAST WALL K3* | 1.5 | -20 | | | 28 | | | | | |
| 9 | T112A EXTERIOR SOUTH WALL E3* | 0.0 | -48 | | | 29 | | | | | |
| 10 | T112A EXTERIOR ROOF A2* | 0.0 | 40 | N/A | | 30 | N/A | | | | |
| 11 | T112B ROOM 1 CEILING B3* | 4.5 | -24 | | | 31 | | | | | |
| 12 | T112B ROOM 2 FLOOR H1* | 0.0 | -20 | | | 32 | | | | | |
| 13 | T112B EXTERIOR SOUTH WALL E2* | 4.5 | 24 | | | 33 | | | | | |
| 14 | T112B EXTERIOR NORTH WALL L1* | 1.5 | -24 | | | 34 | | | | | |
| 15 | T112B EXTERIOR ROOF F1* | 0.0 | 0 | | | 35 | | | | | |
| 16 | T112C ROOM 1 FLOOR C1* | 0.0 | 4 | | | 36 | | | | | |
| 17 | T112C ROOM 3 WALL J2* | 0.0 | 20 | | | 37 | | | | | |
| 18 | T112C ROOM 5 WALL H1* | 0.0 | -56 | | | 38 | | | | | |
| 19 | T112C ROOM 6 FLOOR C1* | 1.5 | 16 | | | 39 | | | | | |
| 20 | T112C EXTERIOR ROOF M3* | 4.5 | 4 | | | 40 | | | | | |

Reviewed: _____ RS Supervision: _____
 Print Name Signature Emp. #

| | removable | | total | |
|----|-----------|------|--------|------|
| | counts | | counts | |
| | alpha | beta | alpha | beta |
| 1 | 1 | 38 | | |
| 2 | 1 | 36 | | |
| 3 | 0 | 42 | | |
| 4 | 0 | 32 | | |
| 5 | 0 | 33 | | |
| 6 | 0 | 34 | | |
| 7 | 0 | 41 | | |
| 8 | 1 | 36 | | |
| 9 | 0 | 29 | | |
| 10 | 0 | 51 | | |
| 11 | 3 | 35 | | |
| 12 | 0 | 36 | | |
| 13 | 3 | 47 | | |
| 14 | 1 | 35 | | |
| 15 | 0 | 41 | | |
| 16 | 0 | 42 | | |
| 17 | 0 | 46 | | |
| 18 | 0 | 27 | | |
| 19 | 1 | 45 | | |
| 20 | 3 | 42 | | |
| 21 | | | | |
| 22 | | | | |
| 23 | | | | |
| 24 | | | | |
| 25 | | | | |
| 26 | | | | |
| 27 | | | | |
| 28 | | | | |
| 29 | | | | |
| 30 | | | | |
| 31 | | | | |
| 32 | | | | |
| 33 | | | | |
| 34 | | | | |
| 35 | | | | |
| 36 | | | | |
| 37 | | | | |
| 38 | | | | |
| 39 | | | | |
| 40 | | | | |

INFORMATION ONLY

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

| INSTRUMENT DATA | | | | | |
|--------------------------------|--------------------------------|----------------------------------------|--|--|--|
| Mfg. <u> </u> | Mfg. <u> </u> | Mfg. <u> </u> | | | |
| Model <u> </u> | Model <u> </u> | Model <u> </u> | | | |
| Serial# <u> </u> | Serial# <u> </u> | Serial# <u> </u> | | | |
| Cal Due <u> </u> | Cal Due <u> </u> | Cal Due <u> </u> | | | |
| Bkg. <u> </u> cpm | Bkg. <u> </u> cpm | Bkg. <u> </u> cpm | | | |
| Efficiency <u> </u> % | Efficiency <u> </u> % | Efficiency <u> </u> % | | | |
| MDA <u> </u> dpm | MDA <u> </u> dpm | MDA <u> </u> dpm | | | |
| Mfg. <u> </u> | Mfg. <u> </u> | Mfg. <u>NETech</u> | | | |
| Model <u> </u> | Model <u> </u> | Model <u>Electra</u> | | | |
| Serial# <u> </u> | Serial# <u> </u> | Serial# <u>1682</u> | | | |
| Cal Due <u> </u> | Cal Due <u> </u> | Cal Due <u>2/4/00</u> | | | |
| Bkg. <u> </u> cpm | Bkg. <u> </u> cpm | Bkg. <u>1</u> <u>319</u> cpm | | | |
| Efficiency <u> </u> % | Efficiency <u> </u> % | Efficiency <u>22.2</u> <u>30.1</u> % | | | |
| MDA <u> </u> dpm | MDA <u> </u> dpm | MDA <u>33</u> <u>285</u> dpm | | | |

| | | | |
|-------------|-------------------------------|--------------------|-------------------|
| Survey Type | <u>CONTAMINATION SURVEY</u> | | |
| Building: | <u>T112B roof resurvey</u> | | |
| Location: | <u>280 Yard</u> | | |
| Purpose: | <u>MARSSIM Release Survey</u> | | |
| RWP #: | <u>N/A</u> | | |
| Date: | <u>08-16-99</u> | Time: | <u>12:00</u> |
| RCT: | <u>Hersey</u> | <u>[Signature]</u> | <u>[Redacted]</u> |
| | Print name | Signature | |
| RCT: | <u>Espinoza</u> | <u>[Signature]</u> | <u>[Redacted]</u> |
| | Print name | Signature | |
| | | | Emp. # |

PRL #:

Comments: Scan Results Are Of Hi Reading In Each Grid.

SURVEY RESULTS

| Type | Location/Description (Results in DPM/100CM ²) | Removable | | Total | | Swipe # | Location/Description (Results in DPM/100CM ²) | Removable | | Total | |
|------|--------------------------------------------------------------|-----------|------|-------|------|---------|--------------------------------------------------------------|-----------|------|-------|------|
| | | Alpha | Beta | Alpha | Beta | | | Alpha | Beta | Alpha | Beta |
| 1 | M1 | | | 185 | 425 | 21 | F3 | | | 189 | 412 |
| 2 | L1 | | | 153 | 352 | 22 | E3 | | | 171 | <285 |
| 3 | K1 | | | 167 | 452 | 23 | D3 | | | 149 | 309 |
| 4 | J1 | | | 194 | <285 | 24 | C3 | | | 162 | <285 |
| 5 | I1 | | | 189 | 349 | 25 | B3 | | | 158 | 346 |
| 6 | H1 | | | 149 | 422 | 26 | A3 | | | 135 | <285 |
| 7 | G1 | | | 167 | 429 | 27 | | | | | |
| 8 | F1 | | | 131 | 322 | 28 | | | | | |
| 9 | E1 | | | 162 | 452 | 29 | | | | | |
| 10 | D1 | | | 171 | 442 | 30 | | | | | |
| 11 | C1 | | | 167 | 422 | 31 | | | | | |
| 12 | B1 | | | 171 | 405 | 32 | | | | | |
| 13 | A1 | | | 185 | 415 | 33 | | | | | |
| 14 | M3 | | | 167 | 329 | 34 | | | | | |
| 15 | L3 | | | 153 | 355 | 35 | | | | | |
| 16 | K3 | | | 162 | 392 | 36 | | | | | |
| 17 | J3 | | | 153 | 419 | 37 | | | | | |
| 18 | I3 | | | 171 | 342 | 38 | | | | | |
| 19 | H3 | | | 149 | 389 | 39 | | | | | |
| 20 | G3 | | | 167 | 329 | 40 | | | | | |

e Reviewed: 8/17/99 RS Supervision: [Signature]

Print Name

Signature

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

INSTRUMENT DATA

| | | |
|------------------|------------------|-----------------------------|
| Mfg. Eberline | Mfg. Eberline | Mfg. Eberline |
| Model SAC-4 | Model SAC-4 | Model SAC-4 |
| Serial# 835 | Serial# 824 | Serial# 824 |
| Cal Due 10/26/99 | Cal Due 10/13/99 | Cal Due 10/13/99 |
| Bkg. 0.1 cpm | Bkg. 0.0 cpm | Bkg. 0.0 cpm |
| Efficiency 33 % | Efficiency 33 % | Efficiency 33 % |
| MDA 6.5 dpm | MDA 6.5 dpm | MDA 6.5 dpm |

| | | |
|------------------|-----------------|----------------------------|
| Mfg. Eberline | Mfg. Eberline | Mfg. Eberline |
| Model BC-4 | Model BC-4 | Model BC-4 |
| Serial# 700 | Serial# 770 | Serial# 770 |
| Cal Due 10/22/99 | Cal Due 1/7/00 | Cal Due 1/7/00 |
| Bkg. 41 cpm | Bkg. 38 cpm | Bkg. 38 cpm |
| Efficiency 25 % | Efficiency 25 % | Efficiency 25 % |
| MDA 200 dpm | MDA 200 dpm | MDA 200 dpm |

Survey Type QA SWIPE SURVEYBuilding: T112 A, B & CLocation: 280 YardPurpose: MARSSIM Release SurveyRWP #: N/ADate: 08-16-99Time: 14:00RCT: Hersey

Print name

Signature

RCT: Espinoza

Print name

Signature

Emp. #

PRL #:

Comments: See individual maps of trailers for survey points

Alpha removable was a two minute count.

SURVEY RESULTS

| ipc | Location/Description (Results in DPM/100CM ²) | Removable | | Total | | Swipe # | Location/Description (Results in DPM/100CM ²) | Removable | | Total | |
|-----|--------------------------------------------------------------|-----------|------|-------|------|------------|--------------------------------------------------------------|-----------|------|-------|------|
| | | Alpha | Beta | Alpha | Beta | | | Alpha | Beta | Alpha | Beta |
| 1 | T112A ROOM 4 WALL A6* | <6.5 | <200 | | | 21 | | | | | |
| 2 | T112A ROOM 6 FLOOR A1* | <6.5 | <200 | | | 22 | | | | | |
| 3 | T112A ROOM 8 WALL P2* | <6.5 | <200 | | | 23 | | | | | |
| 4 | T112A ROOM 9 FLOOR A3* | <6.5 | <200 | | | 24 | | | | | |
| 5 | T112A ROOM 11 WALL K1* | <6.5 | <200 | | | 25 | | | | | |
| 6 | T112A EXTERIOR WEST WALL B1* | <6.5 | <200 | | | 26 | | | | | |
| 7 | T112A EXTERIOR NORTH WALL A1* | <6.5 | <200 | | | 27 | | | | | |
| 8 | T112A EXTERIOR EAST WALL K3* | <6.5 | <200 | | | 28 | | | | | |
| 9 | T112A EXTERIOR SOUTH WALL E3* | <6.5 | <200 | | | 29 | | | | | |
| 10 | T112A EXTERIOR ROOF A2* | <6.5 | <200 | | | 30 | N/A | | | | |
| 11 | T112B ROOM 1 CEILING B3* | <6.5 | <200 | N/A | | 31 | | | | | |
| 12 | T112B ROOM 2 FLOOR H1* | <6.5 | <200 | | | 32 | | | | | |
| 13 | T112B EXTERIOR SOUTH WALL E2* | <6.5 | <200 | | | 33 | | | | | |
| 14 | T112B EXTERIOR NORTH WALL L1* | <6.5 | <200 | | | 34 | | | | | |
| 15 | T112B EXTERIOR ROOF F1* | <6.5 | <200 | | | 35 | | | | | |
| 16 | T112C ROOM 1 FLOOR C1* | <6.5 | <200 | | | 36 | | | | | |
| 17 | T112C ROOM 3 WALL J2* | <6.5 | <200 | | | 37 | | | | | |
| 18 | T112C ROOM 5 WALL H1* | <6.5 | <200 | | | 38 | | | | | |
| 19 | T112C ROOM 6 FLOOR C1* | <6.5 | <200 | | | 39 | | | | | |
| 20 | T112C EXTERIOR ROOF M3* | <6.5 | <200 | | | 40 | | | | | |

Reviewed: 8/17/99 RS Supervision: S Engelhard

Print Name

Signature

Electra Performance Test Log

Instrument Serial Number

1682

Instrument Efficiency Alpha 22.2%

Beta 30.1%

Instrument Calibration Due Date 2-4-00

Source Serial Number

680141

603927

Calibration Due Date

N/A

N/A

Source Act. (dpm)

24830

22723

Source Accel. (cpm)

5512

6840

Source Acceptable Range (sq)

4410 to 6615

5472 to 8208

Date

8/5/99

8/10/99

8/11/99

8/12/99

8/13/99

8/16/99

1/1

1/1

1/1

1/1

1/1

ALPHA Reading
(Corrected cpm)³

4950

5010

5110

5170

4950

4940

Pass

Pass

Pass

Pass

Pass

ALPHA
Pass/Fail

Pass

Pass

Pass

Pass

Pass

Pass

Pass

Pass

Pass

Pass

Pass

BETA Reading
(Corrected cpm)³

486

526

481

502

507

437

Pass

Pass

Pass

Pass

Pass

BETA
Pass/Fail

Pass

Pass

Pass

Pass

Pass

Pass

Pass

Pass

Pass

Pass

Pass

RCT Employee
Number

Pass

Pass

Pass

Pass

Pass

Pass

Pass

Pass

Pass

Pass

Pass

RCT NAME
(Print)

Pass

Pass

Pass

Pass

Pass

Pass

Pass

Pass

Pass

Pass

Pass

RCT Signature

Pass

Pass

Pass

Pass

Pass

Pass

Pass

Pass

Pass

Pass

Pass

1. Source activity in cpm is equal to the source activity in dpm multiplied by the efficiency.

2. Acceptable range is $\pm 20\%$ (source activity in cpm multiplied by 0.8 or 1.2).

3. All counts are to be 1 minute in duration.

NOT: If the instrument will be used for alpha measurements only, the beta portion of the test log should be lined through.

If the instrument will be used for alpha measurements only, the beta portion of the test log should be lined through.

REVIEWED BY: L.N. Cooper

RO SUPERVISOR PRINT NAME

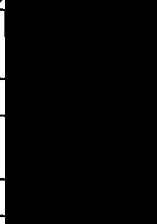
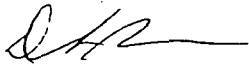
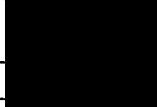

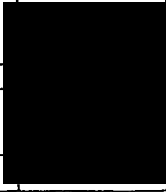
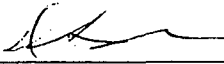


RO SUPERVISOR SIGNATURE

DATE

18-17-99

| | | |
|------------------------------------------------------------------------|----------------------------|------------------------|
| Survey Area: T112 | Survey Unit: Unit C | Building: T112C |
| Survey Unit Description: Office trailer – Pre Demolition Survey | | |

SURVEY PACKAGE COVER SHEET

| | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| Building Information | | |
| Classification: Type 1 <input checked="" type="checkbox"/> Type 2 <input type="checkbox"/> Type 3 <input type="checkbox"/> | | |
| Contaminants of Concern: Plutonium <input checked="" type="checkbox"/> Uranium <input checked="" type="checkbox"/> Other <input type="checkbox"/> | | |
| Special Support Requirements | | |
| Survey points randomly generated by Radiological Engineering | | |
| Special Safety Precautions | | |
| Per 3-PRO-165-RSP-07.02, "Contamination Monitoring Requirements" and IWCP | | |
| Labeling Requirements | | |
| Not Applicable | | |
| Survey Package Implementation | | |
| This survey package is ready for implementation | | |
| D. A. BARNES |  |  |
| Radiological Engineer Printed Name | | Radiological Engineer Signature |
| | | 8-3-99 |
| | | Date |
| H. B. ESTABROOKS |  |  |
| RE Peer Review Printed Name | | RE Peer Review Signature |
| | | 8/3/99 |
| | | Date |
| Survey Package Closure | | |
| All required reviews are complete, and data analysis results meet RLCP criteria. Survey package is authorized for closure. | | |
| D. A. BARNES |  |  |
| Radiological Engineer Printed Name | | Radiological Engineer Signature |
| | | 8-19-99 |
| | | Date |
| ESTABROOKS |  |  |
| RE Manager Printed Name | | RE Manager Signature |
| | | 8/19/99 |
| | | Date |

13/23

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| | | |
|------------------------------------------------------------------------|----------------------------|------------------------|
| Survey Area: T112 | Survey Unit: Unit C | Building: T112C |
| Survey Unit Description: Office trailer – Pre Demolition Survey | | |

SAMPLING AND SURVEY INSTRUCTIONS

| Minimum Survey & Sample Measurement Requirements | | |
|--------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Measurement | Amount & Type | Comments |
| Surface Activity Measurements: | 16 survey points (alpha & beta, direct & removable) on trailer surfaces. 5 duplicate survey points for QA purposes. | Representative surveys of the area will be taken for total and removable, alpha and beta contamination in accordance with 3-PRO-165-RSP-07.02, "Contamination Monitoring Requirements" and IWCP The RCT will document the readings of all surveys performed. QA survey points done by different RCT Duplicate smears will be taken at a directly adjacent location. |
| Surface Scanning: | 10% scan surveys on trailer surfaces. 5% duplicate scan areas for QA purposes. | 1 m ² scan surveys will be performed at locations indicated. Scan surveys of the area will be taken for alpha and beta contamination at a scan rate of 1.5 inches per second. QA scan areas done by different RCT |
| Media Samples: | None | None |
| Volumetric Samples: | None | None |

14/23

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Building T112C Floorplan

| | | | | | |
|--------|--------|--------|--------|--------|--------|
| Room 1 | Room 2 | Room 3 | Room 4 | Room 5 | Room 6 |
| Room 7 | | | | | |

T112C Room 1

[illegible]



Appendix 5

RFETS Radiological and Non-Radiological Trailer 112 A-C Characterization Package



Tomorrow's Nuclear
Cleanup Today

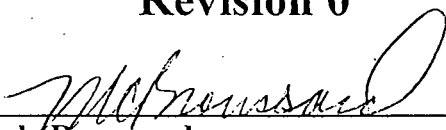


Rocky Flats Environmental Technology Site

Radiological and Non-Radiological Characterization Package for Trailers 112A, B, and C

July 1999

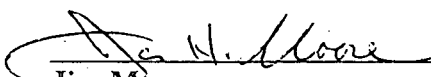
Revision 0



Marla Broussard
RMRS Responsible Manager

8/4/99

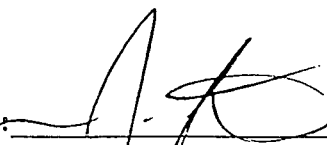
Date



Jim Moore
RMRS Quality Assurance

8/4/99

Date

Approved by: 

Jeff Stevens
Manager, D&D Advanced Planning
Kaiser-Hill Company

8/4/99

Date



Table of Contents
for
Characterization Package for
Trailers T112A, T112B, and T112C

| | | |
|-----|-----------------------------------------------------------------|----|
| 1.0 | Introduction..... | 2 |
| 2.0 | Characterization Instruction for Radiological Surveys | |
| | Package A..... | 3 |
| | Package B..... | 9 |
| | Package C..... | 13 |
| | Package D..... | 17 |
| 3.0 | Characterization Instruction for Non-Radiological Sampling..... | 20 |

1.0 INTRODUCTION

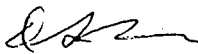
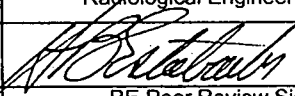
8/4/99
1255
PRE-DEMOLITION

This Characterization Instruction is designed to describe the necessary surveys and sampling for characterization and ~~final status~~ survey of RFETS Trailers T112A, B, and C in preparation for release to commerce.

2.0 CHARACTERIZATION INSTRUCTION FOR RADIOLOGICAL SURVEYS

| | | |
|------------------------------------------------------------------------|----------------------------|------------------------|
| Survey Area: T112 | Survey Unit: Unit A | Building: T112A |
| Survey Unit Description: Office trailer – Pre Demolition Survey | | |

SURVEY PACKAGE COVER SHEET

| | | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------|------------|--------------------------------------------------------------------------------------|--------|
| Building Information | | | |
| Classification: Type 1 <input checked="" type="checkbox"/> Type 2 <input type="checkbox"/> Type 3 <input type="checkbox"/> | | | |
| Contaminants of Concern: Plutonium <input checked="" type="checkbox"/> Uranium <input checked="" type="checkbox"/> Other <input type="checkbox"/> | | | |
| Special Support Requirements | | | |
| Survey points randomly generated by Radiological Engineering | | | |
| Special Safety Precautions | | | |
| Per 3-PRO-165-RSP-07.02, "Contamination Monitoring Requirements" and IWCP | | | |
| Labeling Requirements | | | |
| Not Applicable | | | |
| Survey Package Implementation | | | |
| This survey package is ready for implementation. | | | |
| D. A. BARNES | |  | 8-3-99 |
| Radiological Engineer Printed Name | | Radiological Engineer Signature | Date |
| H. B. ESTABROOKS | |  | 8/3/99 |
| RE Peer Review Printed Name | | RE Peer Review Signature | Date |
| Survey Package Closure | | | |
| All required reviews are complete, and data analysis results meet RLCP criteria. Survey package is authorized for closure. | | | |
| | | | |
| Radiological Engineer Printed Name | Employee # | Radiological Engineer Signature | Date |
| | | | |
| RE Manager Printed Name | Employee # | RE Manager Signature | Date |

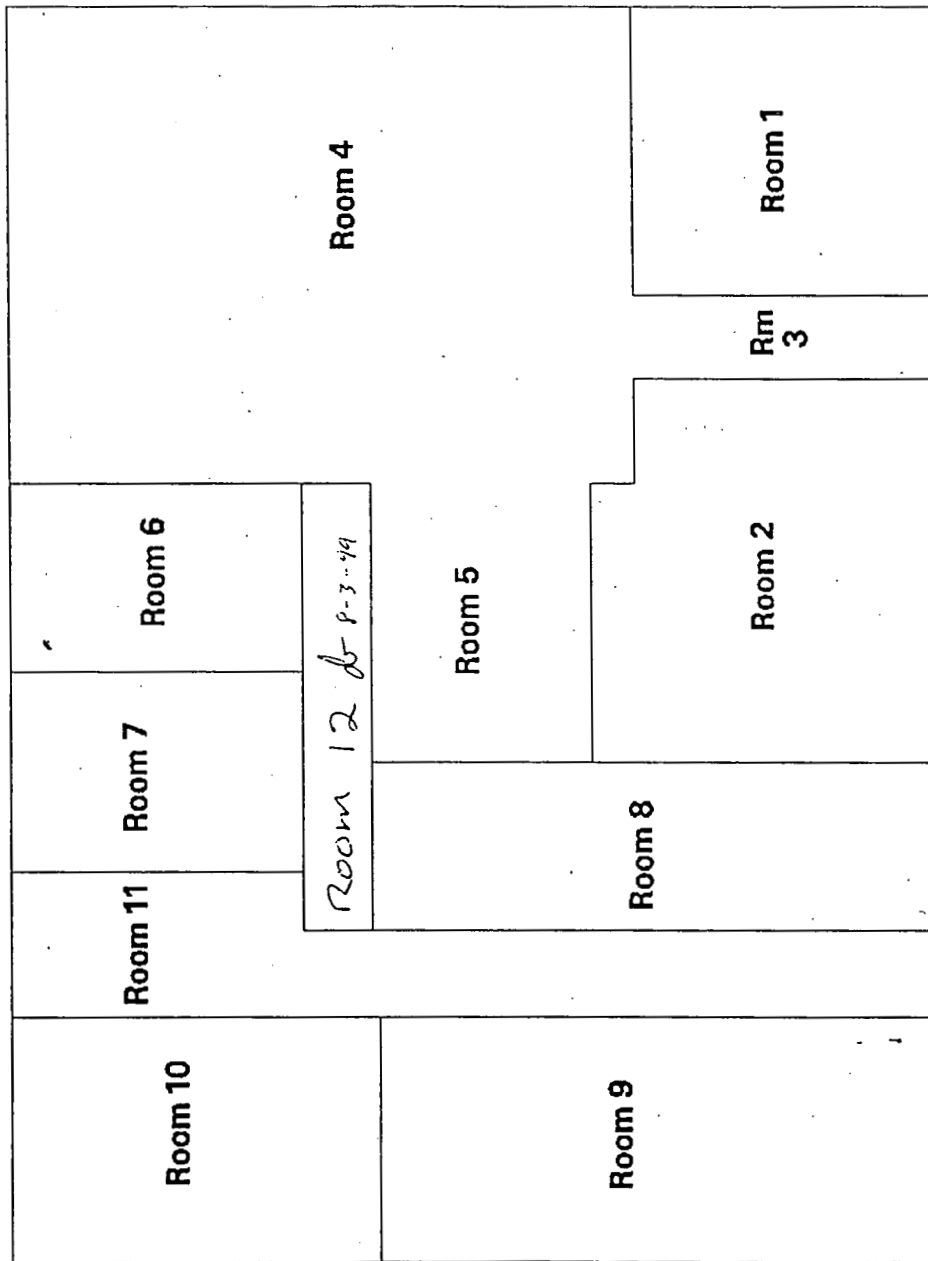
| | | |
|------------------------------------------------------------------------|----------------------------|------------------------|
| Survey Area: T112 | Survey Unit: Unit A | Building: T112A |
| Survey Unit Description: Office trailer – Pre Demolition Survey | | |

SAMPLING AND SURVEY INSTRUCTIONS

| Minimum Survey & Sample Measurement Requirements | | |
|--------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Measurement | Amount & Type | Comments |
| Surface Activity Measurements: | 16 survey points (alpha & beta, direct & removable) on trailer surfaces. 5 duplicate survey points for QA purposes. | Representative surveys of the area will be taken for total and removable, alpha and beta contamination in accordance with 3-PRO-165-RSP-07.02, "Contamination Monitoring Requirements" and IWCP The RCT will document the readings of all surveys performed. QA survey points done by different RCT Duplicate smears will be taken at a directly adjacent location. |
| Surface Scanning: | 10% scan surveys on trailer surfaces. 5% duplicate scan areas for QA purposes. | 1 m ² scan surveys will be performed at locations indicated. Scan surveys of the area will be taken for alpha and beta contamination at a scan rate of 1.5 inches per second. QA scan areas done by different RCT |
| Media Samples: | None | None |
| Volumetric Samples: | None | None |

6/23

Building T112A Floorplan

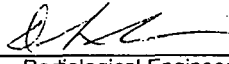



| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | | |
|----|--------------|---|---|-------|----|-------|----|---------|---|----|----|--------------|---------|-------|----|----|---------|----|----|---------|----|--------------|----|-------|----|----|--------------|----|----|----|----|---------|-------|----|--|--|
| | T112A Room 1 | | | | | | | | | | N | T112A Room 3 | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 4 | | | | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | 3 | | | Floor | 3 | | | Ceiling | | | | 3 | | Floor | 3 | | Ceiling | | | | | | | | | | | | | | | | | | | |
| 3 | 2 | | | | 2 | | | | | | | 2 | | | 2 | | | | | | 2 | | | | | | | | | | | | Walls | | | |
| 4 | 1 | | | | 1 | | | | | | | 1 | | | 1 | | | | | | 1 | | | | | | | | | | | | | | | |
| 5 | | A | B | | | | A | B | | | | | | A | | | A | | | | | A | B | C | D | E | F | G | H | I | | | | | | |
| 6 | 2 | | | | | | | | | | | Walls | | | | | | | | | | T112A Room 5 | | | | | | | | | | | | | | |
| 7 | 1 | | | | | | | | | | | | | | | | | | | 3 | | | | | | 3 | | | | | | | | | | |
| 8 | | A | B | C | D | E | F | G | H | I | J | K | | | | | | | | 2 | | | | Floor | 2 | | | | | | | Ceiling | | | | |
| 9 | T112A Room 2 | | | | | | | | | | | | | | | | | | | | 1 | | | | | | 1 | | | | | | | | | |
| 10 | 4 | | | | | | | | 4 | | | | | | | | | | | | A | B | C | | | | | A | B | C | | | | | | |
| 11 | 3 | | | | | | | | 3 | | | | | | | | | | | | 2 | | | | | | | | | | | | Walls | | | |
| 12 | 2 | | | | | Floor | 2 | | | | | | Ceiling | | | | | | | 1 | | | | | | | | | | | | | | | | |
| 13 | 1 | | | | | | | | 1 | | | | | | | | | | | | | A | B | C | D | E | F | G | H | I | J | | | | | |
| 14 | | A | B | C | D | E | | | | A | B | C | D | E | | | | | | | | | | | | | | | | | | | | | | |
| 15 | 2 | | | | | | | | | | | | | | | | | | | Walls | | | | | | | T112A Room 6 | | | | | | | | | |
| 16 | 1 | | | | | | | | | | | | | | | | | | | | | | | Floor | | | | | | | | Ceiling | | | | |
| 17 | | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | | | | | 4 | | | | 4 | | | | | | | |
| 18 | T112A Room 4 | | | | | | | | | | | | | | | | | | | | | | | | | | 3 | | | 3 | | | | | | |
| 19 | 8 | | | | | | | | | | 8 | | | | | | | | | | | | | | | 2 | | | 2 | | | | | | | |
| 20 | 7 | | | | QA | | | Floor | 7 | | | | | | | | | | | Ceiling | | | | | | 1 | | | 1 | | | | | | | |
| 21 | 6 | | | | | | | | | | 6 | | | | | | | | | | | | | | | | A | B | | | A | B | | | | |
| 22 | 5 | | | | | | | | | | 5 | | | | | | | | | | | | | | | | | | | | | | Walls | | | |
| 23 | 4 | | | | | | | | | | 4 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 24 | 3 | | | | | | | | | | 3 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 25 | 2 | | | | | | | | | | 2 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 26 | 1 | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 27 | | A | B | C | D | E | F | G | | | | A | B | C | D | E | F | G | | | | | | | | | | | | | | | | | | |
| 28 | 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | Walls | | | |
| 29 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 30 | | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | AA | AB | | | | | | | |
| 31 | T112A Room 7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 32 | 4 | | | | | | | | 4 | | | | | | | | | | | | | | | | | | | | | | | | Walls | | | |
| 33 | 3 | | | | | Floor | 3 | | | | | Ceiling | 2 | | | | | | | | | | | | | | | | | | | | QA | | | |
| 34 | 2 | | | QA | | | 2 | | | | | | 1 | | | | | | | | | | | | | | | | | | | | | | | |
| 35 | 1 | | | | | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 36 | | A | B | C | | | | A | B | C | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 37 | 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 38 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 39 | | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | | | | | | | | | | | | | | | | |
| 40 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 41 | T112A Room 9 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 42 | | | | | | Floor | | | | | | Ceiling | | | | | | | | | | | | | | | | | | | | | | | | |
| 43 | 7 | | | | | | QA | 7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 44 | 6 | | | | | | | 6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 45 | 5 | | | | | | | 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 46 | 4 | | | | | | | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 47 | 3 | | | | | | | 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 48 | 2 | | | | | | | 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 49 | 1 | | | | | | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 50 | | A | B | C | | | | A | B | C | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 51 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

8/23

| | | |
|------------------------------------------------------------------------|----------------------------|------------------------|
| Survey Area: T112 | Survey Unit: Unit B | Building: T112B |
| Survey Unit Description: Office trailer – Pre Demolition Survey | | |

SURVEY PACKAGE COVER SHEET

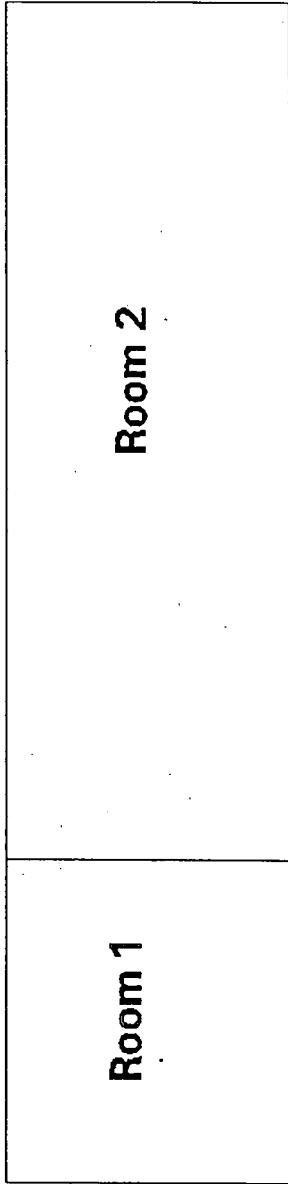
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|---------------------------------------------------------------------------------------------------------------------------------------------------|------------|--------------------------------------------------------------------------------------|--------|
| Building Information | | | |
| Classification: Type 1 <input checked="" type="checkbox"/> Type 2 <input type="checkbox"/> Type 3 <input type="checkbox"/> | | | |
| Contaminants of Concern: Plutonium <input checked="" type="checkbox"/> Uranium <input checked="" type="checkbox"/> Other <input type="checkbox"/> | | | |
| Special Support Requirements | | | |
| Survey points randomly generated by Radiological Engineering | | | |
| Special Safety Precautions | | | |
| Per 3-PRO-165-RSP-07.02, "Contamination Monitoring Requirements" and IWCP | | | |
| Labeling Requirements | | | |
| Not Applicable | | | |
| Survey Package Implementation | | | |
| This survey package is ready for implementation. | | | |
| D. A. BARNES | |  | 8-3-99 |
| Radiological Engineer Printed Name | | Radiological Engineer Signature | Date |
| H. B. ESTABROOKS | |  | 8/3/99 |
| RE Peer Review Printed Name | | RE Peer Review Signature | Date |
| Survey Package Closure | | | |
| All required reviews are complete, and data analysis results meet RLCP criteria. Survey package is authorized for closure. | | | |
| | | | |
| Radiological Engineer Printed Name | Employee # | Radiological Engineer Signature | Date |
| | | | |
| RE Manager Printed Name | Employee # | RE Manager Signature | Date |

| | | |
|------------------------------------------------------------------------|----------------------------|------------------------|
| Survey Area: T112 | Survey Unit: Unit B | Building: T112B |
| Survey Unit Description: Office trailer – Pre Demolition Survey | | |

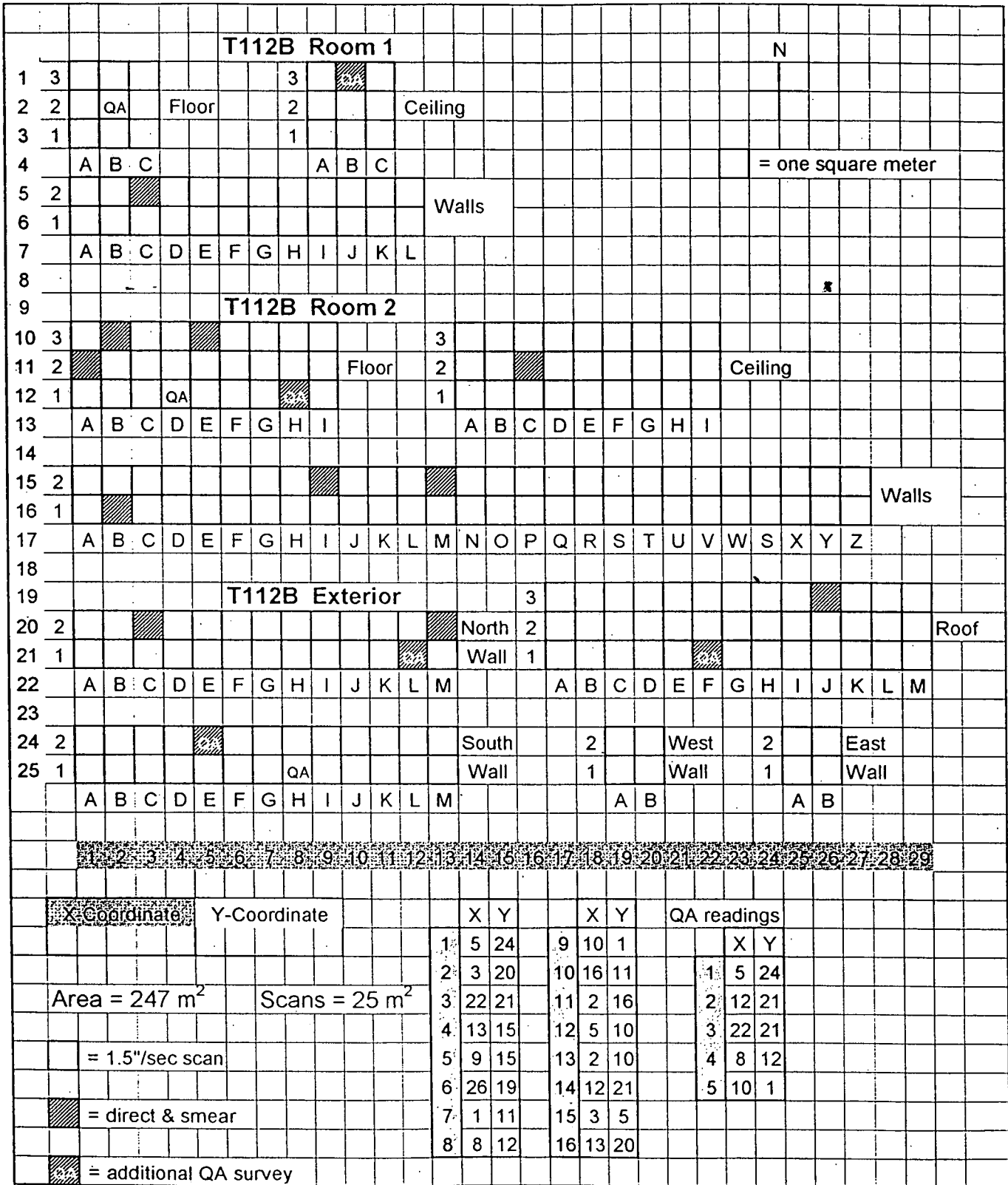
SAMPLING AND SURVEY INSTRUCTIONS

| Minimum Survey & Sample Measurement Requirements | | |
|--------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Measurement | Amount & Type | Comments |
| Surface Activity Measurements: | 16 survey points (alpha & beta, direct & removable) on trailer surfaces. 5 duplicate survey points for QA purposes. | Representative surveys of the area will be taken for total and removable, alpha and beta contamination in accordance with 3-PRO-165-RSP-07.02, "Contamination Monitoring Requirements" and IWCP The RCT will document the readings of all surveys performed. QA survey points done by different RCT Duplicate smears will be taken at a directly adjacent location. |
| Surface Scanning: | 10% scan surveys on trailer surfaces. 5% duplicate scan areas for QA purposes. | 1 m ² scan surveys will be performed at locations indicated. Scan surveys of the area will be taken for alpha and beta contamination at a scan rate of 1.5 inches per second. QA scan areas done by different RCT |
| Media Samples: | None | None |
| Volumetric Samples: | None | None |

Building T112B Floorplan



**112 Trailers PDS
Unit B - T112B
SURVEY POINTS**



12/23

| | | |
|------------------------------------------------------------------------|----------------------------|------------------------|
| Survey Area: T112 | Survey Unit: Unit C | Building: T112C |
| Survey Unit Description: Office trailer – Pre Demolition Survey | | |

SURVEY PACKAGE COVER SHEET

| | | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------|------------|---------------------------------|--------|
| Building Information | | | |
| Classification: Type 1 <input checked="" type="checkbox"/> Type 2 <input type="checkbox"/> Type 3 <input type="checkbox"/> | | | |
| Contaminants of Concern: Plutonium <input checked="" type="checkbox"/> Uranium <input checked="" type="checkbox"/> Other <input type="checkbox"/> | | | |
| Special Support Requirements | | | |
| Survey points randomly generated by Radiological Engineering | | | |
| Special Safety Precautions | | | |
| Per 3-PRO-165-RSP-07.02, "Contamination Monitoring Requirements" and IWCP | | | |
| Labeling Requirements | | | |
| Not Applicable | | | |
| Survey Package Implementation | | | |
| This survey package is ready for implementation. | | | |
| D. A. BARNES | | [Signature] | 8-3-99 |
| Radiological Engineer Printed Name | | Radiological Engineer Signature | Date |
| H. B. ESTABROOKS | | [Signature] | 8/3/99 |
| RE Peer Review Printed Name | | RE Peer Review Signature | Date |
| Survey Package Closure | | | |
| All required reviews are complete, and data analysis results meet RLCP criteria. Survey package is authorized for closure. | | | |
| | | | |
| Radiological Engineer Printed Name | Employee # | Radiological Engineer Signature | Date |
| | | | |
| RE Manager Printed Name | Employee # | RE Manager Signature | Date |

| | | |
|------------------------------------------------------------------------|----------------------------|------------------------|
| Survey Area: T112 | Survey Unit: Unit C | Building: T112C |
| Survey Unit Description: Office trailer – Pre Demolition Survey | | |

SAMPLING AND SURVEY INSTRUCTIONS

| Minimum Survey & Sample Measurement Requirements | | |
|--------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Measurement | Amount & Type | Comments |
| Surface Activity Measurements: | 16 survey points (alpha & beta, direct & removable) on trailer surfaces. 5 duplicate survey points for QA purposes. | Representative surveys of the area will be taken for total and removable, alpha and beta contamination in accordance with 3-PRO-165-RSP-07.02, "Contamination Monitoring Requirements" and IWCP The RCT will document the readings of all surveys performed. QA survey points done by different RCT Duplicate smears will be taken at a directly adjacent location. |
| Surface Scanning: | 10% scan surveys on trailer surfaces. 5% duplicate scan areas for QA purposes. | 1 m ² scan surveys will be performed at locations indicated. Scan surveys of the area will be taken for alpha and beta contamination at a scan rate of 1.5 inches per second. QA scan areas done by different RCT |
| Media Samples: | None | None |
| Volumetric Samples: | None | None |

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Building T112C Floorplan

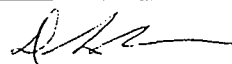

| | | | | | |
|--------|--------|--------|--------|--------|--------|
| Room 1 | Room 2 | Room 3 | Room 4 | Room 5 | Room 6 |
| Room 7 | | | | | |

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16/23

| | | |
|------------------------------------------------------------------------|----------------------------|------------------------|
| Survey Area: T112 | Survey Unit: Unit D | Building: T112A |
| Survey Unit Description: Office trailer – Pre Demolition Survey | | |

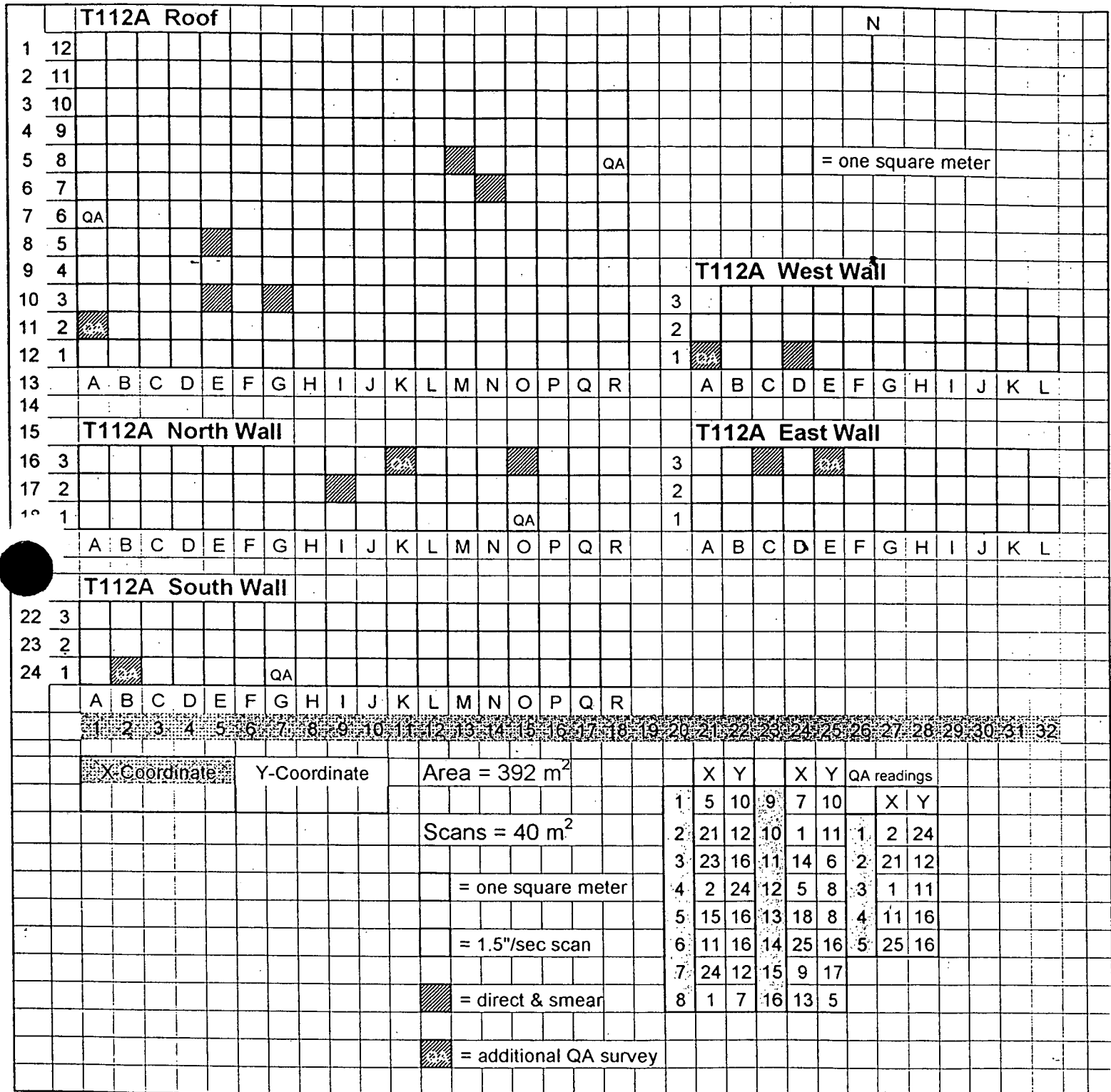
SURVEY PACKAGE COVER SHEET

| | | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------|------------|--------------------------------------------------------------------------------------|--------|
| Building Information | | | |
| Classification: Type 1 <input checked="" type="checkbox"/> Type 2 <input type="checkbox"/> Type 3 <input type="checkbox"/> | | | |
| Contaminants of Concern: Plutonium <input checked="" type="checkbox"/> Uranium <input checked="" type="checkbox"/> Other <input type="checkbox"/> | | | |
| Special Support Requirements | | | |
| Survey points randomly generated by Radiological Engineering | | | |
| Special Safety Precautions | | | |
| Per 3-PRO-165-RSP-07.02, "Contamination Monitoring Requirements" and IWCP | | | |
| Labeling Requirements | | | |
| Not Applicable | | | |
| Survey Package Implementation | | | |
| This survey package is ready for implementation | | | |
| D. A. BARNES | |  | 8-3-99 |
| Radiological Engineer Printed Name | | Radiological Engineer Signature | Date |
| H. B. ESTABROOKS | |  | 8/3/99 |
| RE Peer Review Printed Name | | RE Peer Review Signature | Date |
| Survey Package Closure | | | |
| All required reviews are complete, and data analysis results meet RLCP criteria. Survey package is authorized for closure. | | | |
| | | | |
| Radiological Engineer Printed Name | Employee # | Radiological Engineer Signature | Date |
| | | | |
| RE Manager Printed Name | Employee # | RE Manager Signature | Date |

| | | |
|------------------------------------------------------------------------|----------------------------|------------------------|
| Survey Area: T112 | Survey Unit: Unit D | Building: T112A |
| Survey Unit Description: Office trailer – Pre Demolition Survey | | |

SAMPLING AND SURVEY INSTRUCTIONS

| Minimum Survey & Sample Measurement Requirements | | |
|--------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Measurement | Amount & Type | Comments |
| Surface Activity Measurements: | 16 survey points (alpha & beta, direct & removable) on trailer surfaces. 5 duplicate survey points for QA purposes. | Representative surveys of the area will be taken for total and removable, alpha and beta contamination in accordance with 3-PRO-165-RSP-07.02, "Contamination Monitoring Requirements" and IWCP The RCT will document the readings of all surveys performed. QA survey points done by different RCT Duplicate smears will be taken at a directly adjacent location. |
| Surface Scanning: | 10% scan surveys on trailer surfaces. 5% duplicate scan areas for QA purposes. | 1 m ² scan surveys will be performed at locations indicated. Scan surveys of the area will be taken for alpha and beta contamination at a scan rate of 1.5 inches per second. QA scan areas done by different RCT |
| Media Samples: | None | None |
| Volumetric Samples: | None | None |



3.0 CHARACTERIZATION INSTRUCTION FOR NON-RADIOLOGICAL SAMPLING

NON-RADIOLOGICAL CHARACTERIZATION PACKAGE COVER SHEET

Building Information

Classification: Type 1 ☒ Type 2 ☐ Type 3 ☐

Contaminants of Concern: Plutonium ☒ Uranium ☒ Other ☒ RCRA Constituents,
Lead, Beryllium, PCBs, Asbestos

Special Support Requirements

None.

Special Safety Precautions

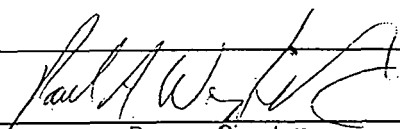

None.

Labeling Requirements

None.

Characterization Instruction Implementation

This survey package is ready for implementation. Adequate detail is provided satisfy DQO's. These DQO's and data evaluation requirements are covered in the *Decontamination and Decommissioning Characterization Protocol*, MAN-077-DDCP.

| | | | |
|-----------------------|--|--------------------------------------------------------------------------------------|----------|
| Paul A. Wojtaszek | |  | 08/04/99 |
| Preparer Printed Name | | Preparer Signature | Date |
| Jim Moore | |  | 8/4/99 |
| Reviewer Printed Name | | Reviewer Signature | Date |

SAMPLING AND SURVEY INSTRUCTIONS

Sampling Requirements: No sampling for non-radiological contaminants is required for this characterization. All characterization for non-radiological contaminants will be done using historical data.

| Measurement | Amount & Type | Comments |
|--------------------|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| RCRA constituents | None | According to historical data and process knowledge, no chemicals were used or stored in any of the three trailers (<i>D&D Facility Characterization Interview Checklist and Attached Facility Checklist and HRR Manager's Report</i>). Therefore, sampling for chemical contaminants is unnecessary and will not be conducted. |
| Lead (Pb) in paint | None | <p>Wooden stairs and platforms have been attached to the trailers and are coated with paint which has not been characterized for Pb content. These stairs and platforms will be disposed of as waste. However, Environmental Waste Compliance Guidance #27, <i>Lead-based Paint (LBP) and Lead-based paint Debris Disposal</i>, has directed that LBP debris generated outside of currently identified HCA's shall be managed as non-hazardous (solid) wastes, and additional analysis for characteristics of hazardous waste derived from LBP is not a requirement for disposal. Therefore, analysis of Pb in paint from wooden stairs and platforms is unnecessary and will not be conducted.</p> <p>The paint on the interior and exterior surfaces of the trailers has not been characterized for Pb in paint. Such characterization is not required for release of the trailers to commerce. Therefore, analysis of Pb in paint from the interior and exterior surfaces of the trailers is unnecessary and will not be conducted.</p> |
| Beryllium | None | <p>There is no record of beryllium operations or storage being carried out in any of the three trailers (<i>D&D Facility Characterization Interview Checklist and Attached Facility Checklist and HRR Manager's Report</i>, and <i>List of Known Beryllium Areas</i>).</p> <p>Additionally, these trailers have been used as administrative office space since their arrival on site, and the <i>RFETS Administrative Equipment Characterization for Beryllium Contamination Project Plan Report</i> showed no detectable beryllium contamination in the 60 RFETS buildings with no record of beryllium activities that were studied.</p> <p>However, since T112 A, B, and C were not included in that study,</p> |

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| | | |
|----------------------------------|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | | <p>the CBDPP conducted an independent beryllium survey of T112A, which confirmed absence of detectable beryllium contamination. The results of this survey will be included in the T112 RLCR.</p> <p>No additional beryllium sampling will be conducted as part of this characterization package.</p> |
| Polychlorinated biphenyls (PCBs) | None | <p>A high voltage electrical power transformer is mounted on a concrete pad outside the southwest corner of T112A, and is labelled "No PCBs." There is no record of PCB use or storage in any of the trailers (<i>D&D Facility Characterization Interview Checklist and Attached Facility Checklist and HRR Manager's Report</i>). Therefore, analysis for PCBs within the trailers is unnecessary and will not be conducted.</p> <p>Wooden stairs and platforms have been attached to the trailers and are coated with paint which has not been characterized for PCB content. These stairs and platforms will be disposed of as waste. However, Environmental Waste Compliance Guidance #25, <i>Management of Polychlorinated Biphenyls (PCBs) in Paint and Other Bulk Product Waste During Facility Disposition</i>, has directed that applied dried paints, varnishes, waxes, or other similar coatings or sealants are acceptable for disposal (with notification) in a non-hazardous solid waste landfill as PCB Bulk Product Waste under 40 CFR 761.3 and 40 CFR 761.62 paragraph (b) and therefore need not be sampled as long as restrictions outlined in 40 CFR 761.62 regarding their disposal are met.</p> <p>Additionally, while the paint on the interior and exterior surfaces of the trailers has not been characterized for PCBs in paint, such characterization is not required for release of the trailers to commerce. Therefore, analysis of PCBs in paint from the interior and exterior surfaces of the trailers is unnecessary and will not be conducted.</p> |
| Asbestos | None | <p>Historical asbestos inspection data exist for T112 A,B, and C. Thirteen samples of floor tile, wall, and ceiling material were taken in T112A, and of these, 4 floor tile samples were determined to be asbestos-containing. Six samples of floor tile, wall, and ceiling material were taken in T112B, and of these, 1 floor tile sample was determined to be asbestos-containing. Nine samples of floor tile, wall, and ceiling material were taken in T112C, and no asbestos was detected. For release to commerce, this information must be disclosed, but further characterization is unnecessary. Therefore, no further asbestos inspection or sampling will be conducted.</p> |

Appendix 6

Final Sampling: Analysis Plan For Roofing Material from Trailers T112A and T112B for Isotopic Analysis, (RF/RMRS-99-332)

PH 07/21/99



Final Sampling and Analysis Plan for Roofing Material from Trailers T112A and T112B for Isotopic Analysis

RF/RMRS-99-332



JUL 21 1999



July 21, 1999

Administrative Information

Site: Rocky Flats Environmental Technology Site
Golden, Colorado

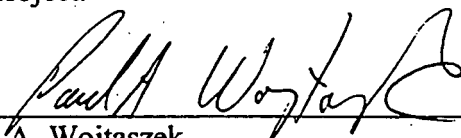
Project Name: Sampling of Roofing Material From Trailers T112A and T112B
for Isotopic Analysis

Date Prepared: July 20, 1999

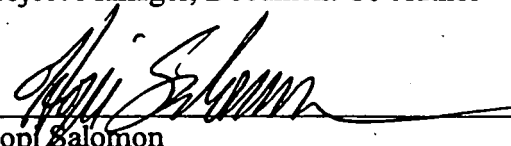
Date Effective: July 21, 1999

Approvals


I have read and approved this sampling and analysis plan with respect to the objectives of the project.

 07/21/99

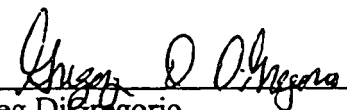
Paul A. Wojtaszek
Project Manager, Document Co-Author

 7/21/99


Hopi Salomon
Document Peer Review

 7/21/99

Dave Barnes
Radiological Engineer, Document Co-Author

 7/21/99

Greg DiGregorio
RMRS Quality Assurance

 7/21/99

Marla Broussard
Manager, Characterization

1.0 INTRODUCTION

Trailer T112A was assembled at Central Avenue and Fourth Street, behind the northwest corner of Bldg. 112, in the early 1960's. The size of the T112A is approximately 45' X 60' and it is assembled from 5 trailer units of approximately 12' X 45' in size. The siding and the skirting (which is approximately 28" high) consists of enamel on aluminum. The trailer is structurally sound. The foundation is concrete blocks and the tie down method for the unit is steel cable from the trailer's I-beam secured to concrete caissons. T112A is unoccupied at the present time, but has previously served as office space for a travel office, transportation security scheduling office, and company store.

Trailer T112B was moved to Central Avenue and Fourth Street, behind the northwest corner of Bldg. 112 in 1990 or 1991 from the Bldg. 771 trailer park. At this time the interior was refurbished. T112B has a nearly full length wooden deck with a sloped roof on its south side. The siding and the skirting consists of enamel on aluminum. It has served as a site for folding laundry, telecommunications office space, and storage of telecommunications equipment. It is presently unoccupied. The tiedown method is unclear due to the intact skirting.

Trailer T112C was put in place at Central Avenue and Fourth Street, behind the northwest corner of Bldg. 112 in 1991. The entryways are covered by wooden panels. The siding and the skirting consists of enamel on aluminum. It has served as office space for the Wackenhut scheduling office. It is presently unoccupied. The tiedown method is unclear due to the intact skirting.

Asbestos characterization data exist for the interior of both trailers, and show asbestos in the floor tile mastic. Hazardous chemicals were not known to be used or stored in these trailers. The trailers have not been characterized for use of lead-based paint.

The purpose of this Sampling and Analysis Plan (SAP) is to collect data to satisfy data gaps regarding radiological contamination of the roofing material of T112A and T112B.

Due to past RFETS experience with the unrestricted release of similar structures it is considered prudent to obtain two media samples each from the roofing material of both T112A and T112B, for a total of four samples. Samples will be taken by the RFETS CAS sample team in accordance with CAS SOP-003, *Commodore Advanced Sciences, Waste Characterization Procedure*, and section 3.1.1.2 of the Pre-Demolition Survey Plan, excerpted in Section 3.0, *Sample Collection and Analysis*.

2.0 DATA QUALITY OBJECTIVES

Decisions must be made as to whether Trailers T112A, T112B, and T112C are radiologically contaminated or eligible for free-release from the site. These decisions will be based on both radiological surveys and radiochemistry samples. This SAP and the DQOs within it only address the radiochemical characterization needs of the project, as radiological surveys shall be covered in a separate characterization package. Further, radiochemistry samples must be collected at the earliest possible time in the project to comply with the project's schedule constraints. Based on visual inspections and historical use of the trailers for administrative purposes only, potential of chemical hazards within or on the trailers has been ruled-out.

The Problem

The quantity and types of radioactivity and radioactive contamination present in and on the trailer are not known with adequate confidence to ensure compliance with free-release criteria; therefore, adequate measurements must be taken to properly characterize the trailers as contaminated or not contaminated. All areas of the trailer shall be characterized through radiological surveys; however, actinides of interest within bulk material on two of the trailer rooftops (Trailers 112A and 112B) must be established through radiochemical analysis because initial radiological surveys (fixed contamination) indicate contamination, but based on site history and process knowledge, naturally-occurring radionuclides (not of DOE origin) are suspected.

Identification of Decisions

What types and quantities of radioactive contamination exist in the bulk matrix of roofing materials, and if present, is contamination above or below free-release levels for the actinides of interest?

Inputs to the Decisions

Inputs to the decision rule include

- radiochemistry results (Pu-239/40, Am-241, U-233/234, U-235, and U-238) from the four samples of interest -- 2 from Trailer 112A and 2 from Trailer 112B,
- quality assurance aspects of the data, including precision, accuracy, representativeness, completeness, and comparability (i.e., the PARCC parameters),
 - gross alpha & beta (for DOT shipping limits and compliance),
- unrestricted release criteria (1-P73-HSP-18.10, Appendix 1).

Radiological instrumentation planned for the project is controlled by K-H Analytical Services Division through contractual requirements with onsite and offsite (radiochemistry) vendors. All instrument sensitivities are adequate for producing results comparable to free-release action levels and compliance with DOT requirements.

Definition of the Boundaries

Three-dimensional boundaries for defining the levels and extent of radioactive contamination are given restricted to the Trailer rooftop exteriors referenced above.

There are no temporal boundaries relative to technical data quality; time constraints depend only on project schedule.

Decision Rules

After conversion of radiochemistry concentrations (from bulk samples) to dpm/100 cm², if the sum-of-ratios of the collective suite of actinides is less than unity (1) for each sample (using the Appendix 1, 1-P73-HSP-18.10 [based on DOE Order 5400.5] free-release level of 100 dpm/100cm² in the denominator of each ratio), the associated rooftop contains no DOE-added radiological contamination; otherwise, the rooftop material is contaminated and is considered low-level waste.

The use of this decision rule has precedence through its implementation by radiological engineering on the Building 779 Decommissioning Project, and subsequent approval of the methodology and results by DOE RFFO, CDPHE, and EPA Region VIII.

Limits on Decision Errors

Based on homogeneity of the bulk material in question, a statistical sampling of the roofs is not necessary, and thus statistical error on the sample set results is not applicable. Random counting errors that are actinide- and sample-specific will be reported with all results, and are typically <10% at elevated levels and <20% at levels near the MDC.

Optimization of the Sampling Design

If results indicate contamination levels greater than free-release levels, additional samples will be planned to better characterize the trailers in total.

3.0 SAMPLE COLLECTION AND ANALYSIS

T112A is constructed with a tar paper roof that has been painted at some time after installation with a heat reflective paint.

T112B has a heavily oxidized metal roof. Previous surveys of site trailers of similar age and construction have exhibited high alpha count rates due to the deposit of naturally occurring radioactive materials (such as Po-210 or radon daughters) in this porous oxide layer.

For each trailer (T112A and T112B), two locations will be selected by Radiological Engineering based on experience and professional judgement. A minimum of 125 gm is required for each analytical sample, and an additional 125 gm is required for the accompanying radscreen sample at each sample location. The radscreen sample will be taken immediately adjacent to the analytical sample. The individual weight of all samples will be determined using a calibration-certified scale and recorded. The samples will consist of square or rectangular sections with a surface area of a minimum of 100 cm², and this surface area will be measured with a ruler or tape measure and recorded. These samples will be sent to an off site laboratory and analyzed for the five RFETS isotopes of concern (Pu-239/40, Am-241, U-233/234, U-235, and U-238) to ensure that no DOE

radioactive material is trapped beneath the heat reflective paint. The analytical laboratory Statement of Work will be modified such that the complete sample is tare weighed and digested, and that in addition to providing a concentration-based result (i.e., pCi/gm), the laboratory will be required to provide a total activity per isotope for the entire sample.

Pre-sampling and post-sampling radiological surveys will be required.

NOTE: T112C, which is also located in the vicinity of T112A and T112B, is the youngest of the three trailers and has a rubberized textile roof that is in good condition. Little or no alpha activity is anticipated. Its roof will not be sampled since previous survey activities exhibited activity less than DCGLs.

Samples will be collected using the sampling techniques described in CAS SOP-003, *Commodore Advanced Sciences, Waste Characterization Procedure*. Roofing material will be removed utilizing a utility knife or tin snips, as required by the material. A water spray mist will be used as necessary in order to prevent generation of dust, due to the (low) potential for asbestos in the roofing material. No asbestos characterization of the roof will be performed. Glass sample jars will be used to collect samples, and signed custody seals will be applied after sample collection. Quality control samples, such as rinsates, duplicates, and trip blanks, are not required for this effort.

4.0 SAMPLE DESIGNATION

Each sample will be assigned a unique number in accordance with the RFETS Analytical Services Division (ASD) requirements. The unique sample number will be broken down into the following three parts:

- Report Identification Number (RIN)
- Event Number
- The Bottle Number

The first part of the number will be the RIN, which is assigned by the ASD. The RIN is used by the ASD to track and file analytical data. It is expected that one RIN will be assigned, however, if the project is not completed quickly, ASD may assign additional RINs. The RIN will be a seven digit alphanumeric code starting with "99" for 1999. The RIN will be followed by a dash "-" and then the event number. The event number is a three digit code, starting with "001" under the RIN, and will be sequential. Each typical sample location will have a unique event number under the RIN. The event number will be followed by a period "." and then the sequential bottle number. The bottle number will be used to identify individual sample containers collected at the same location and same event number.

In addition to the sample numbering scheme above, additional information will be collected with respect to each sample. This additional information will include:

- Sample type
- Location code

5.0 SAMPLE HANDLING AND DOCUMENTATION

Sample custody will be maintained and documented using RFETS chain of custody forms. Sampling equipment (e.g., utility knife, tin snips) will be decontaminated between sampling locations. Decontamination will be performed using a spray rinse of distilled or deionized water followed by wiping with a Kimwipe™. The sampling tool will then be visually verified free of contamination, prior to its next use. Sampling information shall be documented on field log sheets or notebook. The originator shall authenticate (legibly sign and date) each completed hardcopy of the data. A peer reviewer, someone other than the originator, shall perform a review of the logsheet/notebook. The peer reviewer shall authenticate each hardcopy completed by the originator. Any modifications shall be lined-through, initialed, and dated by the reviewer (in ink). The QA Records for the project include the field log sheet and chain-of-custody forms.

6.0 PROJECT ORGANIZATION

Table 6-1 lists the responsible personnel assigned to this project, their responsibilities and contact information.

Table 6-1 Personnel Supporting the T112 A and T112B Roofing Characterization

| Name | Responsibility | Phone | Pager | Radio |
|--------------------------------------------------------|------------------------------------|-------|----------|-------|
| Paul Wojtaszek | Project Manager | 3125 | None | 3723 |
| Dave Barnes | Radiological Engineer | 5352 | 212-6541 | 3759 |
| Dave Farler | Industrial Hygiene | 4340 | 212-6555 | 3734 |
| Dan Lippencott William Santiago Michelle Hershey | Commodore Sample Team | 5267 | 212-3129 | 3502 |
| Greg DiGregorio | Quality Assurance | 5688 | 212-6206 | none |
| Marla Broussard | Characterization Manager | 6007 | 212-6261 | none |
| Stan Jablkowski | Radiological Control Technician | 2397 | none | none |
| Letty Cooper | Radiological Operations Supervisor | 2397 | 212-2333 | 3208 |

Appendix 7
Historical Inspection Report for T112A

7112A
NVLAQ

LAB NO. 1896

LAB I.D. 10768

ASBESTOS - TEM, PCM, PLM, SEM
METALS - AA, FLAME/FURNACE
AIRBORNE PARTICULATES
SPECIAL PARTICLE ANALYSIS

RESERVOIRS ENVIRONMENTAL SERVICES, INC.

1827 GRANT STREET

DENVER, COLORADO 80203

(800) 678-7374

(303) 830-1986

FAX (303) 863-9196

July 18, 1994

Ms. Julie Linkus
EG&G Rocky Flats Plant
PO Box 464
Golden, CO 80402-0464

RE: Job No. RES 20768 - 23586JL/147A - Bulk Samples:
112A9407137301, 112A9407137302, 112A9407137303,
112A9407137304, 112A9407137305, 112A9407137306,
112A9407137307, 112A9407137308, 112A9407137309,
112A9407137310, 112A9407137311, 112A9407137312 and
112A9407137313.

Dear Ms. Linkus:

Reservoirs Environmental Services, Inc. (RES, Inc.) has analyzed 13 bulk material samples by Polarized Light Microscopy (PLM) for asbestos content as per your request. The samples were received on July 14, 1994, and initial results were telephoned to your office on July 18, 1994. PLM was used to analyze the bulk materials in compliance with guidelines established by the USEPA (40 CFR Part 763, Subpart F, Appendix A). The Analytical Results are presented in Table I.

RES, Inc. has assigned job number RES 20768 to this study. This report is considered highly confidential and the sole property of EG&G Rocky Flats Plant. RES, Inc. will not discuss any part of this study with personnel other than those of the client company. Samples will be disposed of after sixty days unless longer storage is requested. The US EPA guideline (40 CFR Part 763, Subpart F, Appendix A) was developed for use on friable building materials and is not recommended for non-friable materials such as floor tiles. RES, Inc. recommends additional analyses to confirm negative PLM results on floor tiles.

RESERVOIRS ENVIRONMENTAL SERVICES, INC.

NVLAP Accredited Laboratory, #896

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TABLE I. PLM BULK ANALYSIS, PERCENTAGE COMPOSITION BY VOLUME

RES Job Number: RES 20768
 Client: EG&G Rocky Flats Plant
 Client Project: 23586JL/147A,
 Date Samples Received: July 14, 1994
 Analysis Type: PLM Short Report
 Turnaround: 3-5 Day

| Client Sample Number | Lab ID Number | TOTAL ASBESTOS (%) | Layer | Physical Description | Portion of Total Sample (%) | ASBESTOS CONTENT BY LAYER | | Non-Asbestos Fibrous Components (%) | | | | | | Non-Fibrous Components (%) |
|----------------------|---------------|--------------------|-------|------------------------------|-----------------------------|---------------------------|---------------------|-------------------------------------|---|---|---|---|---|----------------------------|
| | | | | | | Mineral | Visual Estimate (%) | C | G | S | H | W | T | |
| | | | | | | | | E | L | Y | A | O | A | |
| | | | | | | | | L | A | N | I | L | L | |
| | | | | | | | | L | S | T | R | L | C | |
| | | | | | | | | S | H | | | | | |
| 112A9407137301 | EM 128531 | ND | A | Tan paint | 3 | | ND | 0 | 0 | 0 | 0 | 0 | 0 | 100 |
| | | | B | Tan & brown fibrous material | 12 | | ND | 97 | 0 | 0 | 0 | 0 | 0 | 3 |
| | | | C | White fibrous plaster | 85 | | ND | 10 | 0 | 0 | 0 | 0 | 0 | 90 |
| 112A9407137302 | EM 128532 | ND | A | Tan paint | 3 | | ND | 0 | 0 | 0 | 0 | 0 | 0 | 100 |
| | | | B | Tan & brown fibrous material | 12 | | ND | 97 | 0 | 0 | 0 | 0 | 0 | 3 |
| | | | C | White fibrous plaster | 85 | | ND | 10 | 0 | 0 | 0 | 0 | 0 | 90 |
| 112A9407137303 | EM 128533 | ND | A | White paint | 5 | | ND | TR | 0 | 0 | 0 | 0 | 0 | 100 |
| | | | B | Brown fibrous material | 95 | | ND | 97 | 0 | 0 | 0 | 0 | 0 | 3 |
| 112A9407137304 | EM 128534 | ND | A | White paint | 5 | | ND | TR | 0 | 0 | 0 | 0 | 0 | 100 |
| | | | B | Brown fibrous material | 95 | | ND | 97 | 0 | 0 | 0 | 0 | 0 | 3 |
| 112A9407137305 | EM 128535 | ND | A | White paint | 5 | | ND | TR | 0 | 0 | 0 | 0 | 0 | 100 |
| | | | B | Tan fibrous material | 95 | | ND | 97 | 0 | 0 | 0 | 0 | 0 | 3 |
| 112A9407137306 | EM 128536 | ND | A | White paint | 5 | | ND | TR | 0 | 0 | 0 | 0 | 0 | 100 |
| | | | B | Tan fibrous material | 95 | | ND | 97 | 0 | 0 | 0 | 0 | 0 | 3 |
| 112A9407137307 | EM 128537 | ND | A | White paint | 5 | | ND | TR | 0 | 0 | 0 | 0 | 0 | 100 |
| | | | B | Tan fibrous material | 95 | | ND | 97 | 0 | 0 | 0 | 0 | 0 | 3 |
| | | | | | | | ND | 0 | 0 | 0 | 0 | 0 | 0 | 100 |

ND = None Detected
 TR = Trace

CELL = Cellulose
 Mat = Material

ORG = Organic
 BRUC = Brucite

WOLL = Wollastonite
 Trem-Act = Tremolite-Actinolite

GYP = Gypsum
 SYNTH = Synthetic

Analyst: BG

Data QA

RESERVOIRS ENVIRONMENTAL SERVICES, INC.

NVLAP Accredited Laboratory # 896

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TABLE I. PLM BULK ANALYSIS, PERCENTAGE COMPOSITION BY VOLUME

RES Job Number: RES 20768
 Client: EG&G Rocky Flats Plant
 Client Project: 23586JL/147A,
 Date Samples Received: July 14, 1994
 Analysis Type: PLM Short Report
 Turnaround: 3-5 Day

| Client Sample Number | Lab ID Number | TOTAL ASBESTOS (%) | Layer | Physical Description | Portion of Total Sample (%) | ASBESTOS CONTENT BY LAYER | | Non-Asbestos Fibrous Components (%) | | | | | | Non-Fibrous Components (%) |
|----------------------|---------------|--------------------|-------|-------------------------------------------------------------------|-----------------------------|---------------------------|---------------------|-------------------------------------|----|----|---|---|---|----------------------------|
| | | | | | | Mineral | Visual Estimate (%) | C | G | S | H | W | T | |
| | | | | | | | | E | L | Y | A | O | A | |
| | | | | | | | | L | A | N | I | L | L | |
| | | | | | | | | L | S | T | R | L | C | |
| | | | | | | | | S | H | | | | | |
| 112A9407137308 | EM 128538 | ND | A | Gray resin | 5 | | ND | 0 | 0 | 0 | 0 | 0 | 0 | 100 |
| | | | B | Tan fibrous woven material w/tan resin | 20 | | ND | 98 | 0 | 0 | 0 | 0 | 0 | 2 |
| | | | C | Gray fibrous woven material w/multicolored fibrous woven material | 75 | | ND | 0 | 0 | 95 | 0 | 0 | 0 | 5 |
| 112A9407137309 | EM 128539 | 1.8 | A | Gray resinous material | 5 | | ND | 0 | 0 | 0 | 0 | 0 | 0 | 100 |
| | | | B | Tan resin | 7 | | ND | 0 | 0 | 0 | 0 | 0 | 0 | 100 |
| | | | C | Tan fibrous woven material | 8 | | ND | 98 | 0 | 0 | 0 | 0 | 0 | 2 |
| | | | D | White tile | 15 | Chrysotile | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 88 |
| | | | E | Silver metallic | 25 | | ND | 0 | 0 | 0 | 0 | 0 | 0 | 100 |
| | | | F | Multicolored fibrous woven material | 40 | | ND | 0 | 0 | 99 | 0 | 0 | 0 | 1 |
| 112A9407137310 | EM 128540 | 1.8 | A | Black fibrous tar | 7 | Chrysotile | 25 | 5 | TR | 0 | 0 | 0 | 0 | 70 |
| | | | B | Tan resin | 8 | | ND | 0 | 0 | 0 | 0 | 0 | 0 | 100 |
| | | | C | Tan fibrous resinous material | 25 | | ND | 40 | 5 | 20 | 0 | 0 | 0 | 35 |
| | | | D | Multicolored resinous tile | 60 | | ND | 0 | 0 | 0 | 0 | 0 | 0 | 100 |

ND = None Detected
 TR = Trace

CELL = Cellulose
 Mat = Material

ORG = Organic
 BRUC = Brucite

WOLL = Wollastonite
 Trem-Act = Tremolite-Actinolite

GYP = Gypsum
 SYNTH = Synthetic

Data QA

RESERVOIRS ENVIRONMENTAL SERVICES, INC.

NVLAP Accredited Laboratory # 896

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TABLE I. PLM BULK ANALYSIS, PERCENTAGE COMPOSITION BY VOLUME

ES Job Number: RES 20768
 Client: EG&G Rocky Flats Plant
 Client Project: 23586JL/147A,
 Date Samples Received: July 14, 1994
 Analysis Type: PLM Short Report
 Turnaround: 3-5 Day

| Client Sample Number | Lab ID Number | TOTAL ASBESTOS (%) | Layer | Physical Description | Portion of Total Sample (%) | ASBESTOS CONTENT BY LAYER | | Non-Asbestos Fibrous Components (%) | | | | | | Non-Fibrous Components (%) |
|----------------------|---------------|--------------------|-------|-------------------------------|-----------------------------|---------------------------|---------------------|-------------------------------------|----|----|---|---|---|----------------------------|
| | | | | | | Mineral | Visual Estimate (%) | C | G | S | H | W | T | |
| | | | | | | | | E | L | Y | A | O | A | |
| | | | | | | | | L | A | N | I | L | L | |
| | | | | | | | | L | S | T | R | L | C | |
| | | | | | | | | S | H | | | | | |
| 12A9407137311 | EM 128541 | 0.9 | A | Black fibrous tar | 3 | Chrysotile | 30 | 5 | TR | 0 | 0 | 0 | 0 | 65 |
| | | | B | Tan & brown resin | 7 | | ND | 0 | 0 | 0 | 0 | 0 | 0 | 100 |
| | | | C | Tan fibrous resinous material | 25 | | ND | 45 | 10 | 10 | 0 | 0 | 0 | 35 |
| | | | D | Multicolored resinous tile | 65 | | ND | 0 | 0 | 0 | 0 | 0 | 0 | 100 |
| 12A9407137312 | EM 128542 | ND | A | Tan fibrous material | 3 | | ND | 98 | 0 | 0 | 0 | 0 | 0 | 2 |
| | | | B | Tan resin | 7 | | ND | 0 | 0 | 0 | 0 | 0 | 0 | 100 |
| | | | C | White & tan tile | 90 | | ND | 0 | 0 | 0 | 0 | 0 | 0 | 100 |
| 12A9407137313 | EM 128543 | 2.7 | A | Black tar | 10 | | ND | TR | 0 | 0 | 0 | 0 | 0 | 100 |
| | | | B | White & tan tile | 90 | Chrysotile | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 97 |

ND = None Detected
 R = Trace

CELL = Cellulose
 Mat = Material

ORG = Organic
 BRUC = Brucite

WOLL = Wollastonite
 Trem-Act = Tremolite-Actinolite

GYP = Gypsum
 SYNTH = Synthetic

Data QA

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1. Sample (Bldg-Y-M-D-P#-S#)

112A9407137301 ☐ SINGLE112A9407137301 through 112A9407137301 ☒ MULTIPLE

ROCKY FLATS PLANT INDUSTRIAL HYGIENE BULK SAMPLE FORM

2. Process Title:

6. Analytical Sample Method: PLM

3. Subprocess Title:

7. Lab Report #:

4. Building/OU Etc.: T 112A

8. Lab Method:

5. Chain of Custody Seal #:

9. Related Forms:

| 10. Sample # (Bldg-Y-M-D-P#-S#) | 11. Location Information | 12. Material Type | 13. Bulk Sample Description | 14. Results |
|------------------------------------|-----------------------------------------------|-------------------|-----------------------------|-------------|
| 112A9407137301 | lower left corner (near water cooler) misc | | | |
| 112A9407137302 | Wall - East South Middle (Between rest rooms) | | RG 10 | |
| 112A9407137303 | Ceiling - near light (East) | | RG 10 | |
| 112A9407137304 | Ceiling - above doorway near Exit sign | | RG 10 | |
| 112A9407137305 | Ceiling - East (near window) | | RG 7 | |
| 112A9407137306 | Ceiling | | RG 7 | |
| 112A9407137306 | Ceiling curb | | RG (curb) | |
| 112A9407137307 | Ceiling (Hallway outside Restrooms) | | RG 7 | |
| 112A9407137308 | Floor SE corner carpet flooring | | RG 8 | |
| 112A9407137309 | FLOOR West Behind refrigerator | | RG 8 | |
| 112A9407137310 | Floor Mens Rest Room Entry | | RG 8 | |
| 112A9407137311 | Floor Womens Rest Room Entry | | RG 8 | |
| 112A9407137312 | Floor tile (in front of copier) | | | |
| 112A9407137313 | Floor tile - East closet | | | |
| | | | | |
| | | | | |
| | | | | |

15. Sampled by/Date:

W. S. D. 7/13/94

16. Checked by/Date (Check Back of Form):

EG&G Rocky Mountain Plant, Inc.

Golden, C. 02-0464

Safety and Hygiene Chain of Custody Record and Analysis Request

[illegible]

Rocky Flats Plant Asbestos Containing Material

INSPECTION CHECKLIST

Appendix 1

1. Inspector W.D. Lockwood Signature W.D. Lockwood Accreditation # [REDACTED] State CO
Date 7/13/99

2. BUILDING NO.: T112A
BLDG. AREA CODE:
☒ 1. 1st Floor ☐ 6. Crawl Space
☐ 2. 2nd Floor ☐ 7. Roof
☐ 3. 3rd Floor ☐ 8. Exterior of Bldg.
☐ 4. 4th Floor ☐ 9. Plenum
☐ 5. Basement ☐ 10. Other

3. ROOM NUMBER: _____
COLUMN NUMBERS _____

4. SPECIFIC LOCATION NE corner

5. % FUNCTIONAL SPACE 100%

6. FUNCTIONAL SPACE LD. 22
HOMOGENEOUS AREA LD. 04 - Floor Structure

7. MATERIAL TYPE CATEGORY:
☐ T. Thermal System Insulation
☐ S. Surfacing Material
☒ M. Miscellaneous Material

8.1 TSI/ACM:
PIPE LENGTH (FT) _____

8.2 TSI/ACM:
PIPE DIAMETER (IN.) _____

8.3 TSI/ACM:
PIPE WITH INSULATION DIAMETER (IN.) _____

8.4 SURFACING MISC. ACM:
8.5 TOTAL SURFACE MATERIAL (SQ. FT.)
900 sq. ft.

8.6 SURFACING MISC. ACM:
DEPTH OF SURFACE MATERIAL (IN.)
1/4 inch

9.1 FUNCTION CODE:
☐ 1. Acoustic Insulation ☐ 19. Exterior Construction
☐ 2. Baseboard ☒ 20. Floor Tile
☐ 3. Boiler/Furnace Insulation ☐ 21. Fire Stop
☐ 4. Caulking Matl ☐ 22. Fireproofing Insulation
☐ 5. Ceiling Tile ☐ 23. High Temp Water Pipe
☐ 6. Chilled Water Pipe ☐ 24. High Temp Water Pipe Fitting
☐ 7. Chilled Water Pipe Fitting ☐ 25. Mastic Adhesive
☐ 8. Cold Water Pipe ☐ 26. Roofing
☐ 9. Cold Water Pipe Fitting ☐ 27. Steam Pipe
☐ 10. Condensate Pipe ☐ 28. Steam Pipe Fitting
☐ 11. Condensate Pipe Fitting ☐ 29. Tank Insulation
☐ 12. Cooling Tower Baffles ☐ 30. Transfer Board
☐ 13. Debris/Settled Dust ☐ 31. Vibration Damper
☐ 14. Domestic Cold Water Pipe ☐ 32. Wall Board
☐ 15. Domestic Cold Water Fitting ☐ 33. Wall Insulation
☐ 16. Door ☐ 34. Wall Plaster/Spackle
☐ 17. Drain Pipe ☐ 35. Other: _____
☐ 18. Duct Insulation

9.2 ASBESTOS FORM CODE:

☐ 1. Air cell ☐ 6. Pre-formed
☐ 2. Blanket ☐ 7. Sheet
☐ 3. Block ☐ 8. Sprayed On
☐ 4. Cloth ☐ 9. Troweled On
☐ 5. Loose fill ☒ 10. Other: placed tile

9.3 COLOR CODE:

☐ B Blue ☐ O Orange
☐ BL Black ☒ W White
☐ BR Brown ☐ Y Yellow
☐ G Green ☐ OT Other: _____
☐ GR Gray

10. CONSISTENCY:

☒ Brittle - hard ☐ Fibrous - loose
☐ Semi - solid ☐ Granular - pliable

11. CURRENTLY FRIABLE:

☐ Yes ☒ No

12. CURRENT MATERIAL DAMAGE:

☒ 1. No Visible Damage (U)
☐ 2. Damaged (D)
 < 10% Localized or
 < 25% Distributed
☐ 3. Significant Damage (S)
 10% or more Localized or
 25% or more Distributed

12.1 CAUSE OF DAMAGE:

☐ 1. Area Usage
☐ 2. Vibration
☐ 3. Air Flow
☐ 4. Water Damage
☐ 5. Service Activity
☐ 6. Usual Aging
☐ 7. Other: n/a

13. CONTAMINANT PRESENT:

☒ 0. None
☐ 1. Spotty
☐ 2. Widely Scattered
☐ 3. Entire Area

14. DISPERSAL FACTOR:

☐ 1. Water ☒ 3. Occupant
☐ 2. Air ☐ 4. Machinery

15. AREA USED BY:

☐ Maintenance Workers
☐ Operations Workers
☒ Administrative Personnel
☐ Visiting Public

16. POTENTIAL FOR DAMAGE:

- ☒ Low Potential for damage (L)
- ☐ Potential for damage (M)
- ☐ Potential for significant damage (H)

17.1 DISTURBANCE POTENTIAL

FREQUENCY OF CONTACT/ACCESSIBILITY:

- ☒ 0. Low/Seldom (< 1 time/month)
(e.g., Area Rarely Used)
- ☐ 1. Moderate/Occasional (1-4 times/month)
(e.g., Rooms/Offices)
- ☐ 2. High/Frequently (>4 times/month)
(e.g., Hallways/Corridors)

17.2 DISTURBANCE POTENTIAL

INFLUENCE OF VIBRATION:

- ☒ 0. Low/None
- ☐ 1. Moderate/Noticeable
(Motors, loud sounds, vibrating ducts w/o fan, etc.)
- ☐ 2. High/Extreme
(Easily sensed vibration, vibrating duct w/fan, etc.)

DISTURBANCE POTENTIAL

POTENTIAL FOR AIR EROSION:

- ☒ 0. Low/None
- ☐ 1. Moderate or Noticeable Movement
(Air shaft, Air stream, vent, etc.)
- ☐ 2. High/Extreme velocity
(Air Plenum, Elevator Shaft, Fan Room, etc.)

17.4 DISTURBANCE POTENTIAL

OVERALL POTENTIAL FOR DAMAGE:

- ☒ 0. Low Potential for Damage
- ☐ 1. Potential for Damage
- ☐ 2. Potential for Significant Damage

18. PHYSICAL ASSESSMENT CATEGORY: *n/a*

- ☐ 1. Damaged or Significantly Damaged TSI ACM
- ☐ 2. Damaged Friable Surfacing ACM
- ☐ 3. Significantly Damaged Friable Surfacing ACM
- ☐ 4. Damaged or Significantly Damaged Misc. ACM
- ☐ 5. ACBM with Potential for Damage
- ☐ 6. ACBM with Potential for Significant Damage
- ☐ 7. Any remaining Friable ACBM or Friable suspect ACBM

19. HAZARD POTENTIAL CLASSIFICATION:

- ☒ 1. ACBM in good condition w/low potential for disturbance
- ☐ 2. ACBM in good condition w/potential for damage
- ☐ 3. ACBM in good condition w/potential for significant damage
- ☐ 4. ACBM in Damaged condition w/low potential for disturbance
- ☐ 5. ACBM in Damaged condition w/potential for damage
- ☐ 6. ACBM in Damaged condition w/potential for significant damage
- ☐ 7. ACBM in a Significantly Damaged condition

20. RECOMMENDED RESPONSE ACTION:

- ☐ 1. Response Action #1
- ☐ 2. Response Action #2
- ☐ 3. Response Action #3
- ☐ 4. Response Action #4
- ☐ 5. Response Action #5
- ☐ 6. Response Action #6
- ☐ 7. Response Action #7
- ☒ 8. Response Action #8

21. DAMAGED INVENTORY PRIORITY

- ☐ 1 ☐ 2A ☐ 2B ☒ 3

22. PLANNED ACTIVITY:

- ☐ New Activity/Use
- ☐ System Maintenance *n/a*
- ☐ Required Repair
- ☐ Renovation
- ☐ Demolition

23. OTHER SYSTEMS IMPACTED:

- ☐ System Shutdown *n/a*
- ☐ Backup System In Use
- ☐ No Backup/Alternate
- ☐ Routine System Maintenance

24. POTENTIAL WASTE:

- ☒ Non friable
- ☐ Regulated ACM
- ☐ Radiological Contaminated
- ☐ RCRA Contaminated

25. SAMPLING:

- ☒ ≥ 3 , Non ACM, < 1000 ft.²
- ☐ ≥ 5 , Non ACM, < 5,000 ft.²
- ☐ ≥ 7 , Non ACM, > 5,000 ft.²
- ☐ ≥ 9 , Non ACM
- ☐ 0, Assumed ACM

25.1

| Sample # | % | Asbestos Type |
|----------|-----|---------------|
| 9 | 1.8 | Chrysotile |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

25.2 LAB REPORT

26. WORK PACKAGE NUMBERS

27. COMMENTS: *Carpet covered*

tile

Rocky Flats Plant Asbestos Containing Material

INSPECTION CHECKLIST

Appendix 1

1. Inspector W.D. Lockwood Signature W.D. Lockwood Accreditation # State CO
 Date 7-23-99
2. BUILDING NO.: T-112-A
 BLDG. AREA CODE:
☒ 1. 1st Floor ☐ 6. Crawl Space
☐ 2. 2nd Floor ☐ 7. Roof
☐ 3. 3rd Floor ☐ 8. Exterior of Bldg.
☐ 4. 4th Floor ☐ 9. Plenum
☐ 5. Basement ☐ 10. Other
3. ROOM NUMBER: Closet
 COLUMN NUMBERS N/A
4. SPECIFIC LOCATION Closet NW corner
5. % FUNCTIONAL SPACE 100%
6. FUNCTIONAL SPACE I.D. 04
 HOMOGENEOUS AREA I.D. 05
7. MATERIAL TYPE CATEGORY:
☐ T. Thermal System Insulation
☐ S. Surfacing Material
☒ M. Miscellaneous Material
- 8.1 TSI ACM:
 PIPE LENGTH (FT)
- 8.2 TSI ACM:
 PIPE DIAMETER (IN.)
- 8.3 TSI ACM:
 PIPE WITH INSULATION DIAMETER (IN.)
- 8.4 SURFACING MISC. ACM: 18 sq ft
- 8.5 TOTAL SURFACE MATERIAL (SQ. FT.)
- 8.6 SURFACING MISC. ACM:
 DEPTH OF SURFACE MATERIAL (IN.) 1/4
- 9.1 FUNCTION CODE:
☐ 1. Acoustic Insulation ☐ 19. Exterior Construction
☐ 2. Baseboard ☒ 20. Floor Tile
☐ 3. Boiler/Furnace Insulation ☐ 21. Fire Stop
☐ 4. Caulking Matl ☐ 22. Fireproofing Insulation
☐ 5. Ceiling Tile ☐ 23. High Temp Water Pipe
☐ 6. Chilled Water Pipe ☐ 24. High Temp Water
☐ 7. Chilled Water Pipe Fitting ☐ Pipe Fitting
☐ 8. Cold Water Pipe ☐ 25. Mastic Adhesive
☐ 9. Cold Water Pipe Fitting ☐ 26. Roofing
☐ 10. Condensate Pipe ☐ 27. Steam Pipe
☐ 11. Condensate Pipe Fitting ☐ 28. Steam Pipe Fitting
☐ 12. Cooling Tower Baffles ☐ 29. Tank Insulation
☐ 13. Debris/Settled Dust ☐ 30. Transit Board
☐ 14. Domestic Cold ☐ 31. Vibration Damper
☐ Water Pipe ☐ 32. Wall Board
☐ 15. Domestic Cold ☐ 33. Wall Insulation
☐ Water Fitting ☐ 34. Wall Plaster/Spackle
☐ 16. Door ☐ 35. Other:
☐ 17. Drain Pipe
☐ 18. Duct Insulation
- 9.2 ASBESTOS FORM CODE:
☐ 1. Air cell ☐ 6. Pre-formed
☐ 2. Blanket ☐ 7. Gneat
☐ 3. Block ☐ 8. Sprayed On
☐ 4. Cloth ☐ 9. Troweled On
☐ 5. Loose fill ☐ 10. Other:
- 9.3 COLOR CODE:
☐ B Blue ☐ O Orange
☐ BL Black ☐ W White
☐ BR Brown ☐ Y Yellow
☐ G Green ☐ OT Other:
☒ GR Gray
10. CONSISTENCY:
☒ Brittle - hard ☐ Fibrous - loose
☐ Semi - solid ☐ Granular - pliable
11. CURRENTLY FRIABLE:
☐ Yes ☒ No
12. CURRENT MATERIAL DAMAGE:
☒ 1. No Visible Damage (U)
☐ 2. Damaged (D)
 < 10% Localized or
 < 25% Distributed
☐ 3. Significant Damage (S)
 10% or more Localized or
 25% or more Distributed
- 12.1 CAUSE OF DAMAGE:
☐ 1. Area Usage
☐ 2. Vibration
☐ 3. Air Flow
☐ 4. Water Damage
☐ 5. Service Activity
☒ 6. Usual Aging
☐ 7. Other:
13. CONTAMINANT PRESENT:
☒ 0. None
☐ 1. Spotty
☐ 2. Widely Scattered
☐ 3. Entire Area
14. DISPERSAL FACTOR:
☐ 1. Water ☒ 3. Occupant
☐ 2. Air ☐ 4. Machinery
15. AREA USED BY:
☒ Maintenance Workers
☐ Operations Workers
☐ Administrative Personnel
☐ Visiting Public

16. POTENTIAL FOR DAMAGE:

- ☒ Low Potential for damage (L)
- ☐ Potential for damage (M)
- ☐ Potential for significant damage (H)

17.1 DISTURBANCE POTENTIAL

FREQUENCY OF CONTACT/ACCESSIBILITY:

- ☒ 0. Low/Seldom (< 1 time/month)
(e.g., Area Rarely Used)
- ☐ 1. Moderate/Occasional (1-4 times/month)
(e.g., Rooms/Offices)
- ☐ 2. High/Frequently (>4 times/month)
(e.g., Hallways/Corridors)

17.2 DISTURBANCE POTENTIAL

INFLUENCE OF VIBRATION:

- ☒ 0. Low/None
- ☐ 1. Moderate/Noticeable
(Motors, loud sounds, vibrating ducts w/o fan, etc.)
- ☐ 2. High/Extreme
(Easily sensed vibration, vibrating duct w/fan, etc.)

DISTURBANCE POTENTIAL

POTENTIAL FOR AIR EROSION:

- ☒ 0. Low/None
- ☐ 1. Moderate or Noticeable Movement
(Air shaft, Air stream, vent, etc.)
- ☐ 2. High/Extreme velocity
(Air Plenum, Elevator Shaft, Fan Room, etc.)

17.4 DISTURBANCE POTENTIAL

OVERALL POTENTIAL FOR DAMAGE:

- ☒ 0. Low Potential for Damage
- ☐ 1. Potential for Damage
- ☐ 2. Potential for Significant Damage

18. PHYSICAL ASSESSMENT CATEGORY:

- ☐ 1. Damaged or Significantly Damaged TSI ACM
- ☐ 2. Damaged Friable Surfacing ACM
- ☐ 3. Significantly Damaged Friable Surfacing ACM
- ☐ 4. Damaged or Significantly Damaged Misc. ACM
- ☒ 5. ACBM with Potential for Damage
- ☐ 6. ACBM with Potential for Significant Damage
- ☐ 7. Any remaining Friable ACBM or Friable suspect ACBM

19. HAZARD POTENTIAL CLASSIFICATION:

- ☒ 1. ACBM in good condition w/low potential for disturbance
- ☐ 2. ACBM in good condition w/potential for damage
- ☐ 3. ACBM in good condition w/potential for significant damage
- ☐ 4. ACBM in Damaged condition w/low potential for disturbance
- ☐ 5. ACBM in Damaged condition w/potential for damage
- ☐ 6. ACBM in Damaged condition w/potential for significant damage
- ☐ 7. ACBM in a Significantly Damaged condition

20. RECOMMENDED RESPONSE ACTION:

- ☐ 1. Response Action #1
- ☐ 2. Response Action #2
- ☐ 3. Response Action #3
- ☐ 4. Response Action #4
- ☐ 5. Response Action #5
- ☐ 6. Response Action #6
- ☐ 7. Response Action #7
- ☒ 8. Response Action #8

21. DAMAGED INVENTORY PRIORITY

- ☐ 1 ☐ 2A ☐ 2B ☒ 3

22. PLANNED ACTIVITY:

- ☐ New Activity/Use
- ☒ System Maintenance
- ☐ Required Repair
- ☐ Renovation
- ☐ Demolition

23. OTHER SYSTEMS IMPACTED: *N/A*

- ☐ System Shutdown
- ☐ Backup System In Use
- ☐ No Backup/Alternate
- ☐ Routine System Maintenance

24. POTENTIAL WASTE:

- ☒ Non friable
- ☐ Regulated ACM
- ☐ Radiological Contaminated
- ☐ RCRA Contaminated

25. SAMPLING:

- ☒ ≥ 3 , Non ACM, < 1000 ft.²
- ☐ ≥ 5 , Non ACM, < 5,000 ft.²
- ☐ ≥ 7 , Non ACM, > 5,000 ft.²
- ☐ ≥ 9 , Non ACM
- ☐ 0, Assumed ACM

25.1

| Sample # | % | Asbestos Type |
|----------|-----|---------------|
| 013 | 2.7 | Chrysotile |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

25.2 LAB REPORT

26. WORK PACKAGE NUMBERS

N/A

27. COMMENTS:

Floor tiles are in good shape. Just need to know when it's going to be replaced.

Rocky Flats Plant Asbestos Containing Material INSPECTION CHECKLIST

Appendix 1

1. Inspector W.D. Lockwood Signature W.D. Lockwood Accreditation # State CO
 Date 1.13.94

2. BUILDING NO.: 112A
 BLDG. AREA CODE:
☒ 1. 1st Floor ☐ 6. Crawl Space
☐ 2. 2nd Floor ☐ 7. Roof
☐ 3. 3rd Floor ☐ 8. Exterior of Bldg.
☐ 4. 4th Floor ☐ 9. Plenum
☐ 5. Basement ☐ 10. Other

3. ROOM NUMBER: Restrooms
 COLUMN NUMBERS N/A

4. SPECIFIC LOCATION East Bldg. Center

5. % FUNCTIONAL SPACE

6. FUNCTIONAL SPACE ID. 10690
 HOMOGENEOUS AREA ID. 05

7. MATERIAL TYPE CATEGORY:
☐ T. Thermal System Insulation
☐ S. Surfacing Material
☒ M. Miscellaneous Material

8.1 TSIACM:
 PIPE LENGTH (FT)

8.2 TSIACM:
 PIPE DIAMETER (IN.)

8.3 TSIACM:
 PIPE WITH INSULATION DIAMETER (IN.)

8.4 SURFACING MISC. ACM:
 8.5 TOTAL SURFACE MATERIAL (SQ. FT.) 30 sq ft.
 8.6 SURFACING MISC. ACM:
 DEPTH OF SURFACE MATERIAL (IN.) 1/4 inch

9.1 FUNCTION CODE:
☐ 1. Acoustic Insulation ☐ 19. Exterior Construction
☐ 2. Baseboard ☐ 20. Floor Tile
☐ 3. Boiler/Furnace Insulation ☐ 21. Fire Stop
☐ 4. Caulking Mat'l ☐ 22. Fireproofing Insulation
☐ 5. Ceiling Tile ☐ 23. High Temp Water Pipe
☐ 6. Chilled Water Pipe ☐ 24. High Temp Water
☐ 7. Chilled Water Pipe Fitting ☐ 25. Mastic Adhesive
☐ 8. Cold Water Pipe ☐ 26. Roofing
☐ 9. Cold Water Pipe Fitting ☐ 27. Steam Pipe
☐ 10. Condensate Pipe ☐ 28. Steam Pipe Fitting
☐ 11. Condensate Pipe Fitting ☐ 29. Tank Insulation
☐ 12. Cooling Tower Baffles ☐ 30. Transite Board
☐ 13. Debris/Settled Dust ☐ 31. Vibration Damper
☐ 14. Domestic Cold Water Pipe ☐ 32. Wall Board
☐ 15. Domestic Cold Water Fitting ☐ 33. Wall Insulation
☐ 16. Door ☐ 34. Wall Plaster/Spackle
☐ 17. Drain Pipe ☐ 35. Other:
☐ 18. Duct Insulation

9.2 ASBESTOS FORM CODE:
☐ 1. Air cell ☐ 6. Pre-formed
☐ 2. Blanket ☐ 7. Sreat
☐ 3. Block ☐ 8. Sprayed On
☐ 4. Cloth ☒ 9. Troweled On
☐ 5. Loose fill ☐ 10. Other:

9.3 COLOR CODE:
☒ B Blue ☐ O Orange
☐ BL Black ☐ W White
☐ BR Brown ☐ Y Yellow
☐ G Green ☐ OT Other:
☐ GR Gray

10. CONSISTENCY:
☒ Brittle - hard ☐ Fibrous - loose
☐ Semi - solid ☐ Granular - pileable

11. CURRENTLY FRIABLE:
☐ Yes ☒ No

12. CURRENT MATERIAL DAMAGE:
☒ 1. No Visible Damage (U)
☐ 2. Damaged (D)
 < 10% Localized or
 < 25% Distributed
☐ 3. Significant Damage (S)
 10% or more Localized or
 25% or more Distributed

12.1 CAUSE OF DAMAGE:
☐ 1. Area Usage
☐ 2. Vibration
☐ 3. Air Flow
☐ 4. Water Damage
☐ 5. Service Activity
☐ 6. Usual Aging
☐ 7. Other:

13. CONTAMINANT PRESENT:
☒ 0. None
☐ 1. Spotty
☐ 2. Widely Scattered
☐ 3. Entire Area

14. DISPERSAL FACTOR:
☐ 1. Water ☒ 3. Occupant
☐ 2. Air ☐ 4. Machinery

15. AREA USED BY:
☐ Maintenance Workers
☐ Operations Workers
☒ Administrative Personnel
☐ Visiting Public

16. POTENTIAL FOR DAMAGE:

- ☒ Low Potential for damage (L)
- ☐ Potential for damage (M)
- ☐ Potential for significant damage (H)

17.1 DISTURBANCE POTENTIAL

FREQUENCY OF CONTACT/ACCESSIBILITY:

- ☒ 0. Low/Seldom (< 1 time/month)
(e.g., Area Rarely Used)
- ☐ 1. Moderate/Occasional (1-4 times/month)
(e.g., Rooms/Offices)
- ☐ 2. High/Frequently (>4 times/month)
(e.g., Hallways/Corridors)

17.2 DISTURBANCE POTENTIAL

INFLUENCE OF VIBRATION:

- ☒ 0. Low/None
- ☐ 1. Moderate/Noticeable
(Motors, loud sounds, vibrating ducts w/o fan, etc.)
- ☐ 2. High/Extreme
(Easily sensed vibration, vibrating duct w/fan, etc.)

17.3 DISTURBANCE POTENTIAL

POTENTIAL FOR AIR EROSION:

- ☒ 0. Low/None
- ☐ 1. Moderate or Noticeable Movement
(Air shaft, Air stream, vent, etc.)
- ☐ 2. High/Extreme velocity
(Air Plenum, Elevator Shaft, Fan Room, etc.)

17.4 DISTURBANCE POTENTIAL

OVERALL POTENTIAL FOR DAMAGE:

- ☒ 0. Low Potential for Damage
- ☐ 1. Potential for Damage
- ☐ 2. Potential for Significant Damage

18. PHYSICAL ASSESSMENT CATEGORY: *n/a*

- ☐ 1. Damaged or Significantly Damaged TSI ACM
- ☐ 2. Damaged Friable Surfacing ACM
- ☐ 3. Significantly Damaged Friable Surfacing ACM
- ☐ 4. Damaged or Significantly Damaged Misc. ACM
- ☐ 5. ACBM with Potential for Damage
- ☐ 6. ACBM with Potential for Significant Damage
- ☐ 7. Any remaining Friable ACBM or Friable suspect ACBM

19. HAZARD POTENTIAL CLASSIFICATION:

- ☒ 1. ACBM in good condition w/low potential for disturbance
- ☐ 2. ACBM in good condition w/potential for damage
- ☐ 3. ACBM in good condition w/potential for significant damage
- ☐ 4. ACBM in Damaged condition w/low potential for disturbance
- ☐ 5. ACBM in Damaged condition w/potential for damage
- ☐ 6. ACBM in Damaged condition w/potential for significant damage
- ☐ 7. ACBM in a Significantly Damaged condition

20. RECOMMENDED RESPONSE ACTION:

- ☒ 1. Response Action #1
- ☐ 2. Response Action #2
- ☐ 3. Response Action #3
- ☐ 4. Response Action #4
- ☐ 5. Response Action #5
- ☐ 6. Response Action #6
- ☐ 7. Response Action #7
- ☐ 8. Response Action #8

21. DAMAGED INVENTORY PRIORITY

- ☐ 1 ☐ 2A ☐ 2B ☒ 3

22. PLANNED ACTIVITY: *n/a*

- ☐ New Activity/Use
- ☐ System Maintenance
- ☐ Required Repair
- ☐ Renovation
- ☐ Demolition

23. OTHER SYSTEMS IMPACTED: *n/a*

- ☐ System Shutdown
- ☐ Backup System in Use
- ☐ No Backup/Alternate
- ☐ Routine System Maintenance

24. POTENTIAL WASTE:

- ☒ Non friable
- ☐ Regulated ACM
- ☐ Radiological Contaminated
- ☐ RCRA Contaminated

25. SAMPLING:

- ☒ ≥ 8, Non ACM, < 1000 ft.²
- ☐ ≥ 5, Non ACM, < 5,000 ft.²
- ☐ ≥ 7, Non ACM, > 5,000 ft.²
- ☐ ≥ 9, Non ACM
- ☐ 0, Assumed ACM

25.1

| Sample # | % | Asbestos Type |
|----------|-----|---------------|
| 10 | 1.8 | chrysotile |
| 11 | .9 | chrysotile |
| | | |
| | | |
| | | |
| | | |
| | | |

25.2 LAB REPORT

26. WORK PACKAGE NUMBERS

27. COMMENTS: *In Restroom need to be notified if linoleum is removed.*

Rocky Flats Plant Asbestos Containing Material INSPECTION CHECKLIST

Appendix 1

Inspector W.D. Lockwood Signature [Signature]
Date 4/5/94

Accreditation # [Redacted] State CO

2. BUILDING NO.: T-112-A
BLDG. AREA CODE: 1

- | | |
|--------------------------------------------------|-----------------------------------------------|
| <input checked="" type="checkbox"/> 1. 1st Floor | <input type="checkbox"/> 6. Crawl Space |
| <input type="checkbox"/> 2. 2nd Floor | <input type="checkbox"/> 7. Roof |
| <input type="checkbox"/> 3. 3rd Floor | <input type="checkbox"/> 8. Exterior of Bldg. |
| <input type="checkbox"/> 4. 4th Floor | <input type="checkbox"/> 9. Plenum |
| <input type="checkbox"/> 5. Basement | <input type="checkbox"/> 10. Other |

3. ROOM NUMBER: Company Store
COLUMN NUMBERS N/A

4. SPECIFIC LOCATION Company Store

5. % FUNCTIONAL SPACE 0

6. FUNCTIONAL SPACE I.D. T-112-A-F-02
HOMOGENEOUS AREA I.D. T-112A-H-02

7. MATERIAL TYPE CATEGORY:

- ☒ T. Thermal System Insulation
☐ S. Surfacing Material
☒ M. Miscellaneous Material

8.1 TSIACM:
PIPE LENGTH (FT) N/A

8.2 TSIACM:
PIPE DIAMETER (IN.) N/A
TSIACM:
PIPE WITH INSULATION DIAMETER (IN.) N/A

8.4 SURFACING MISC. ACM:

8.5 TOTAL SURFACE MATERIAL (SQ. FT.)
1800

8.6 SURFACING MISC. ACM:
DEPTH OF SURFACE MATERIAL (IN.) 3/4

9.1 FUNCTION CODE:

- | | |
|----------------------------------------------------------|-----------------------------------------------------------|
| <input type="checkbox"/> 1. Acoustic Insulation | <input type="checkbox"/> 19. Exterior Construction |
| <input type="checkbox"/> 2. Baseboard | <input type="checkbox"/> 20. Floor Tile |
| <input type="checkbox"/> 3. Boiler/Furnace Insulation | <input type="checkbox"/> 21. Fire Stop |
| <input type="checkbox"/> 4. Caulking Mat'l | <input type="checkbox"/> 22. Fireproofing Insulation |
| <input type="checkbox"/> 5. Ceiling Tile | <input type="checkbox"/> 23. High Temp Water Pipe |
| <input type="checkbox"/> 6. Chilled Water Pipe | <input type="checkbox"/> 24. High Temp Water Pipe Fitting |
| <input type="checkbox"/> 7. Chilled Water Pipe Fitting | <input type="checkbox"/> 25. Mastic Adhesive |
| <input type="checkbox"/> 8. Cold Water Pipe | <input type="checkbox"/> 26. Roofing |
| <input type="checkbox"/> 9. Cold Water Pipe Fitting | <input type="checkbox"/> 27. Steam Pipe |
| <input type="checkbox"/> 10. Condensate Pipe | <input type="checkbox"/> 28. Steam Pipe Fitting |
| <input type="checkbox"/> 11. Condensate Pipe Fitting | <input type="checkbox"/> 29. Tank Insulation |
| <input type="checkbox"/> 12. Cooling Tower Baffles | <input type="checkbox"/> 30. Transit Board |
| <input type="checkbox"/> 13. Debris/Settled Dust | <input type="checkbox"/> 31. Vibration Damper |
| <input type="checkbox"/> 14. Domestic Cold Water Pipe | <input checked="" type="checkbox"/> 32. Wall Board |
| <input type="checkbox"/> 15. Domestic Cold Water Fitting | <input type="checkbox"/> 33. Wall Insulation |
| <input type="checkbox"/> 16. Door | <input type="checkbox"/> 34. Wall Plaster/Spackle |
| <input type="checkbox"/> 17. Drain Pipe | <input type="checkbox"/> 35. Other: <u>Wood Panel</u> |
| <input type="checkbox"/> 18. Duct Insulation | |

9.2 ASBESTOS FORM CODE:

- | | |
|----------------------------------------|-----------------------------------------------------|
| <input type="checkbox"/> 1. Air cell | <input type="checkbox"/> 6. Pre-formed |
| <input type="checkbox"/> 2. Blanket | <input type="checkbox"/> 7. Sheet |
| <input type="checkbox"/> 3. Block | <input type="checkbox"/> 8. Sprayed On |
| <input type="checkbox"/> 4. Cloth | <input type="checkbox"/> 9. Troweled On |
| <input type="checkbox"/> 5. Loose fill | <input type="checkbox"/> 10. Other: <u>non ash.</u> |

9.3 COLOR CODE:

- | | |
|-----------------------------------|-----------------------------------------------|
| <input type="checkbox"/> B Blue | <input type="checkbox"/> O Orange |
| <input type="checkbox"/> BL Black | <input type="checkbox"/> W White |
| <input type="checkbox"/> BR Brown | <input type="checkbox"/> Y Yellow |
| <input type="checkbox"/> G Green | <input type="checkbox"/> OT Other: <u>N/A</u> |
| <input type="checkbox"/> GR Gray | |

10. CONSISTENCY:

- | | |
|-----------------------------------------|---------------------------------------------|
| <input type="checkbox"/> Brittle - hard | <input type="checkbox"/> Fibrous - loose |
| <input type="checkbox"/> Semi - solid | <input type="checkbox"/> Granular - pliable |

11. CURRENTLY FRIABLE:

- ☐ Yes ☒ No

12. CURRENT MATERIAL DAMAGE:

- ☒ 1. No Visible Damage (U)
☐ 2. Damaged (D)
 < 10% Localized or
 < 25% Distributed
☐ 3. Significant Damage (S)
 10% or more Localized or
 25% or more Distributed

12.1 CAUSE OF DAMAGE:

- | |
|-----------------------------------------------|
| <input type="checkbox"/> 1. Area Usage |
| <input type="checkbox"/> 2. Vibration |
| <input type="checkbox"/> 3. Air Flow |
| <input type="checkbox"/> 4. Water Damage |
| <input type="checkbox"/> 5. Service Activity |
| <input type="checkbox"/> 6. Usual Aging |
| <input type="checkbox"/> 7. Other: <u>N/A</u> |

13. CONTAMINANT PRESENT:

- ☒ 0. None
☐ 1. Spotty
☐ 2. Widely Scattered
☐ 3. Entire Area

14. DISPERSAL FACTOR:

- | | |
|----------------------------------------------|---------------------------------------|
| <input checked="" type="checkbox"/> 1. Water | <input type="checkbox"/> 3. Occupant |
| <input type="checkbox"/> 2. Air | <input type="checkbox"/> 4. Machinery |

15. AREA USED BY:

- | |
|--------------------------------------------------------------|
| <input type="checkbox"/> Maintenance Workers |
| <input type="checkbox"/> Operations Workers |
| <input checked="" type="checkbox"/> Administrative Personnel |
| <input type="checkbox"/> Visiting Public |

POTENTIAL FOR DAMAGE:

- ☒ Low Potential for damage (L)
- ☐ Potential for damage (M)
- ☐ Potential for significant damage (H)

DISTURBANCE POTENTIAL

FREQUENCY OF CONTACT/ACCESSIBILITY:

- ☒ 0. Low/Seldom (< 1 time/month)
(e.g., Area Rarely Used)
- ☐ 1. Moderate/Occasional (1-4 times/month)
(e.g., Rooms/Offices)
- ☐ 2. High/Frequently (>4 times/month)
(e.g., Hallways/Corridors)

DISTURBANCE POTENTIAL

INFLUENCE OF VIBRATION:

- ☒ 0. Low/None
- ☐ 1. Moderate/Noticeable
(Motors, loud sounds, vibrating ducts w/o fan, etc.)
- ☐ 2. High/Extreme
(Easily sensed vibration, vibrating duct w/fan, etc.)

DISTURBANCE POTENTIAL

POTENTIAL FOR AIR EROSION:

- ☒ 0. Low/None
- ☐ 1. Moderate or Noticeable Movement
(Air shaft, Air stream, vent, etc.)
- ☐ 2. High/Extreme velocity
(Air Plenum, Elevator Shaft, Fan Room, etc.)

DISTURBANCE POTENTIAL

POTENTIAL FOR DAMAGE:

- ☒ Potential for Damage
- ☐ Potential for Damage
- ☐ Potential for Significant Damage

PHYSICAL ASSESSMENT CATEGORY:

- ☐ 1. Damaged or Significantly Damaged TSI ACM
- ☐ 2. Damaged Friable Surfacing ACM
- ☐ 3. Significantly Damaged Friable Surfacing ACM
- ☐ 4. Damaged or Significantly Damaged Misc. ACM
- ☐ 5. ACBM with Potential for Damage
- ☐ 6. ACBM with Potential for Significant Damage
- ☐ 7. Any remaining Friable ACBM or Friable suspect ACBM

HAZARD POTENTIAL CLASSIFICATION:

- ☐ 1. ACBM in good condition w/low potential for disturbance
- ☐ 2. ACBM in good condition w/potential for damage
- ☐ 3. ACBM in good condition w/potential for significant damage
- ☐ 4. ACBM in Damaged condition w/low potential for disturbance
- ☐ 5. ACBM in Damaged condition w/potential for damage
- ☐ 6. ACBM in Damaged condition w/potential for significant damage
- ☐ 7. ACBM in a Significantly Damaged condition

20. RECOMMENDED RESPONSE ACTION:

- ☒ 1. Response Action #1
- ☐ 2. Response Action #2
- ☐ 3. Response Action #3
- ☐ 4. Response Action #4
- ☐ 5. Response Action #5
- ☐ 6. Response Action #6
- ☐ 7. Response Action #7
- ☐ 8. Response Action #8

21. DAMAGED INVENTORY PRIORITY

- ☒ 1 ☐ 2A ☐ 2B ☐ 3

22. PLANNED ACTIVITY:

- ☒ New Activity/Use
- ☐ System Maintenance
- ☐ Required Repair
- ☐ Renovation
- ☐ Demolition

23. OTHER SYSTEMS IMPACTED:

- ☒ System Shutdown
- ☐ Backup System in Use
- ☐ No Backup/Alternate
- ☐ Routine System Maintenance

24. POTENTIAL WASTE:

- ☒ Non friable
- ☐ Regulated ACM
- ☐ Radiological Contaminated
- ☐ RCRA Contaminated

25. SAMPLING:

- ☒ ≥ 3 , Non ACM, < 1000 ft.²
- ☐ ≥ 5 , Non ACM, < 5,000 ft.²
- ☐ ≥ 7 , Non ACM, > 5,000 ft.²
- ☐ ≥ 9 , Non ACM
- ☐ 0, Assumed ACM

25.1

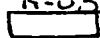
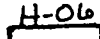


| Sample # | % | Asbestos Type |
|----------|---|---------------|
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| | | |
| | | |
| | | |

25.2 LAB REPORT

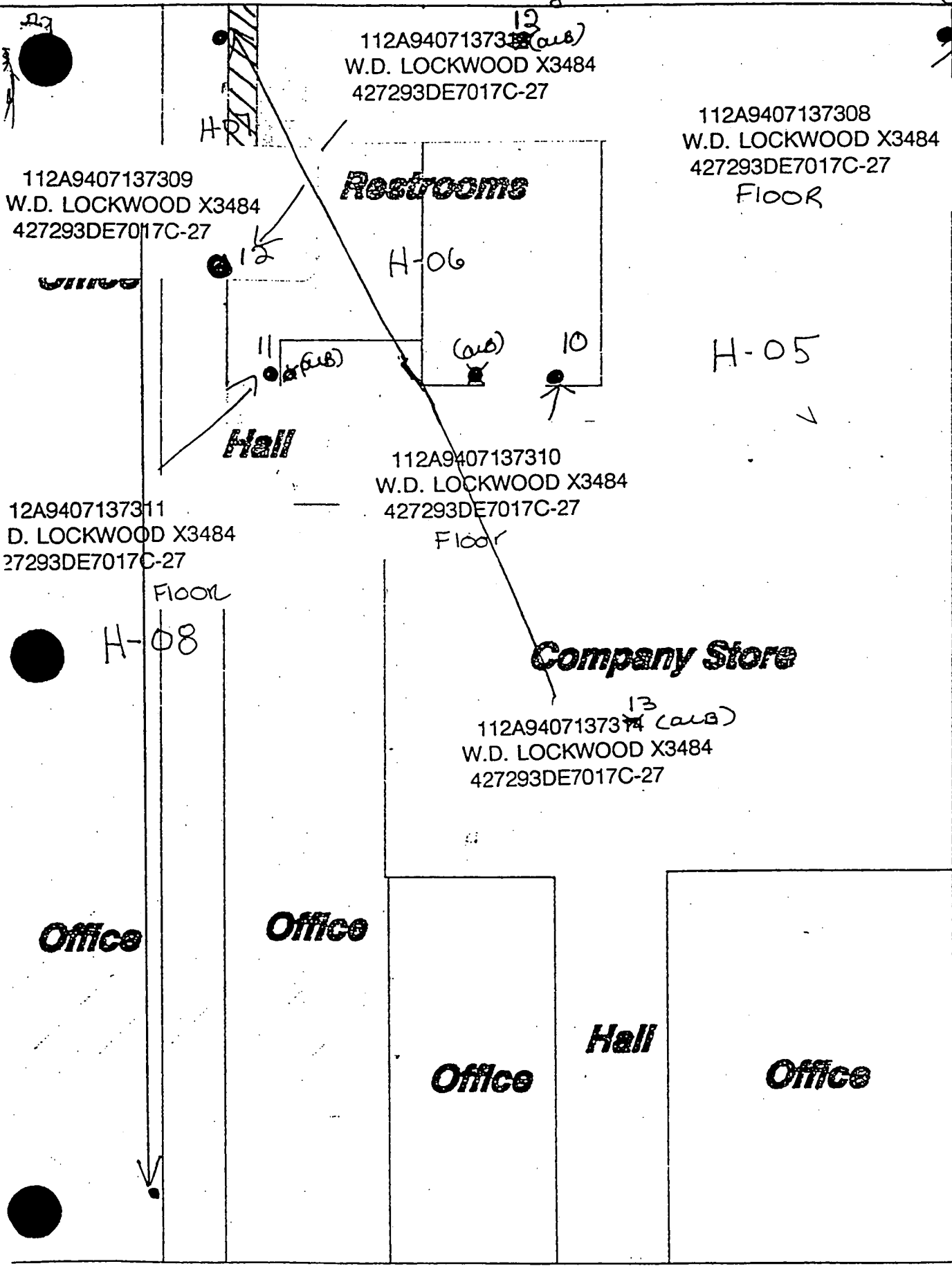
26. WORK PACKAGE NUMBERS

27. COMMENTS:

Wood Paneling
Throughout the Bldg

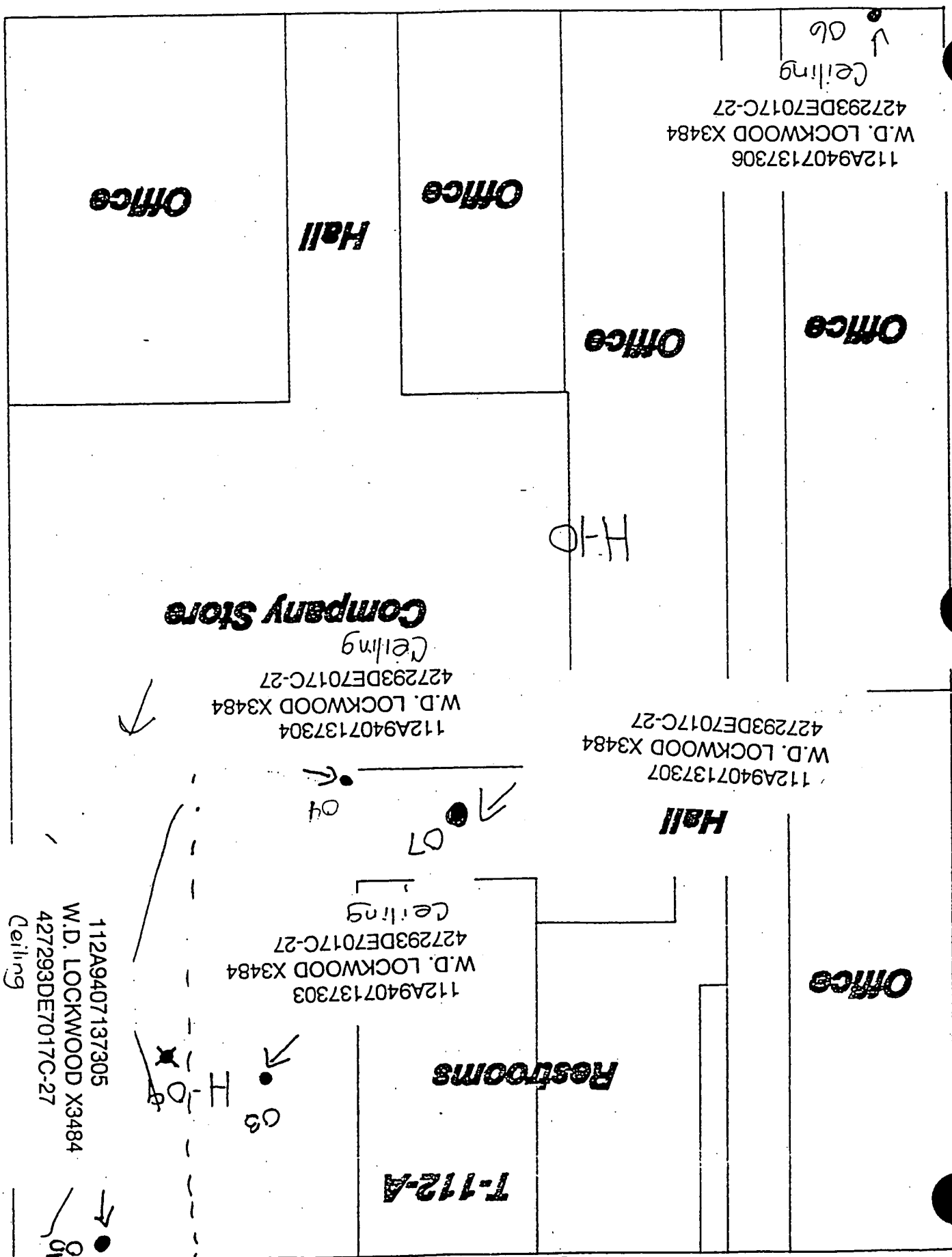
Br. Carpet  12" Tile
 Legend  H-06  H-08
 Linoleum  Gr. Carpet

FLOOR COVERINGS

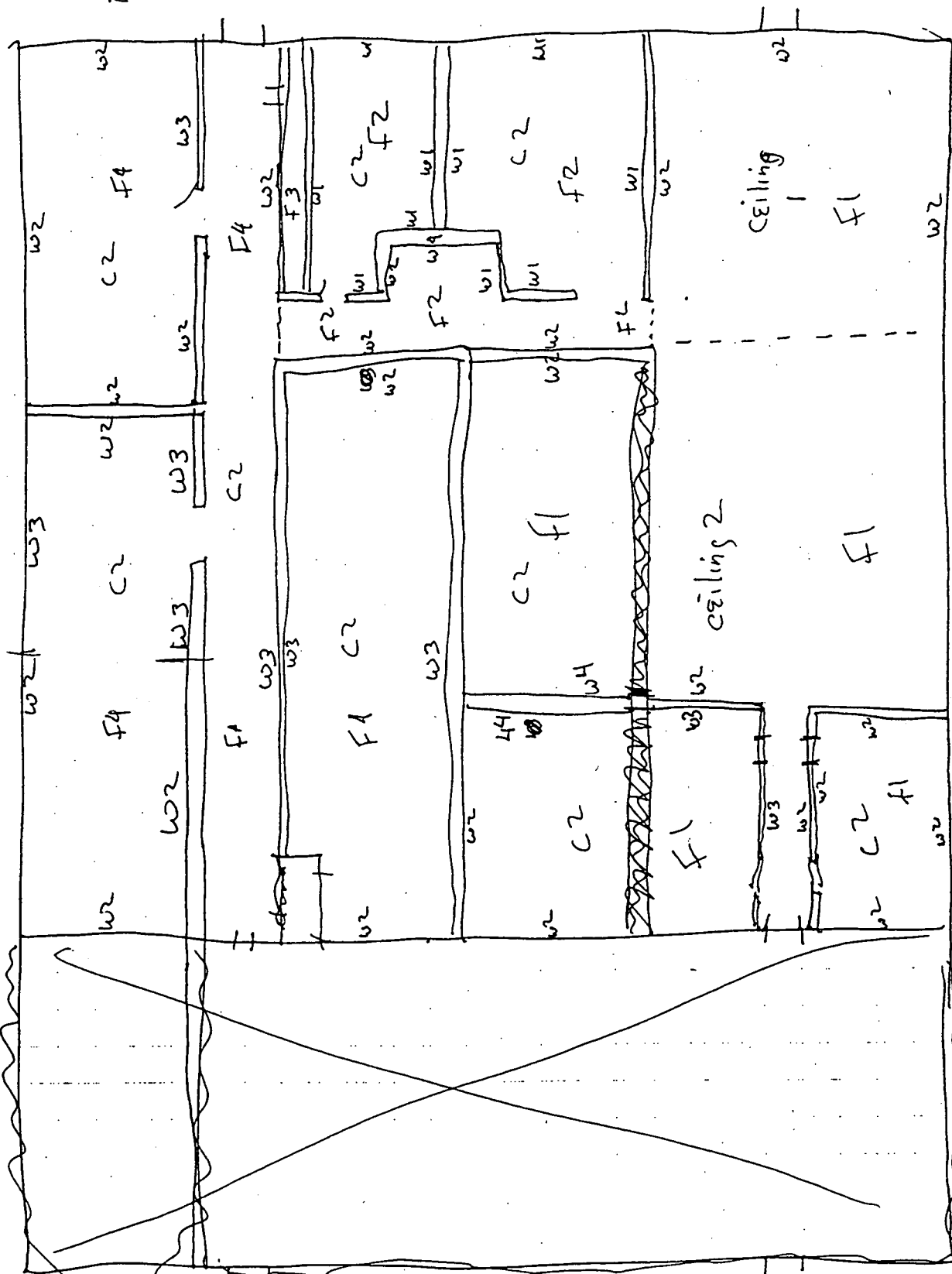


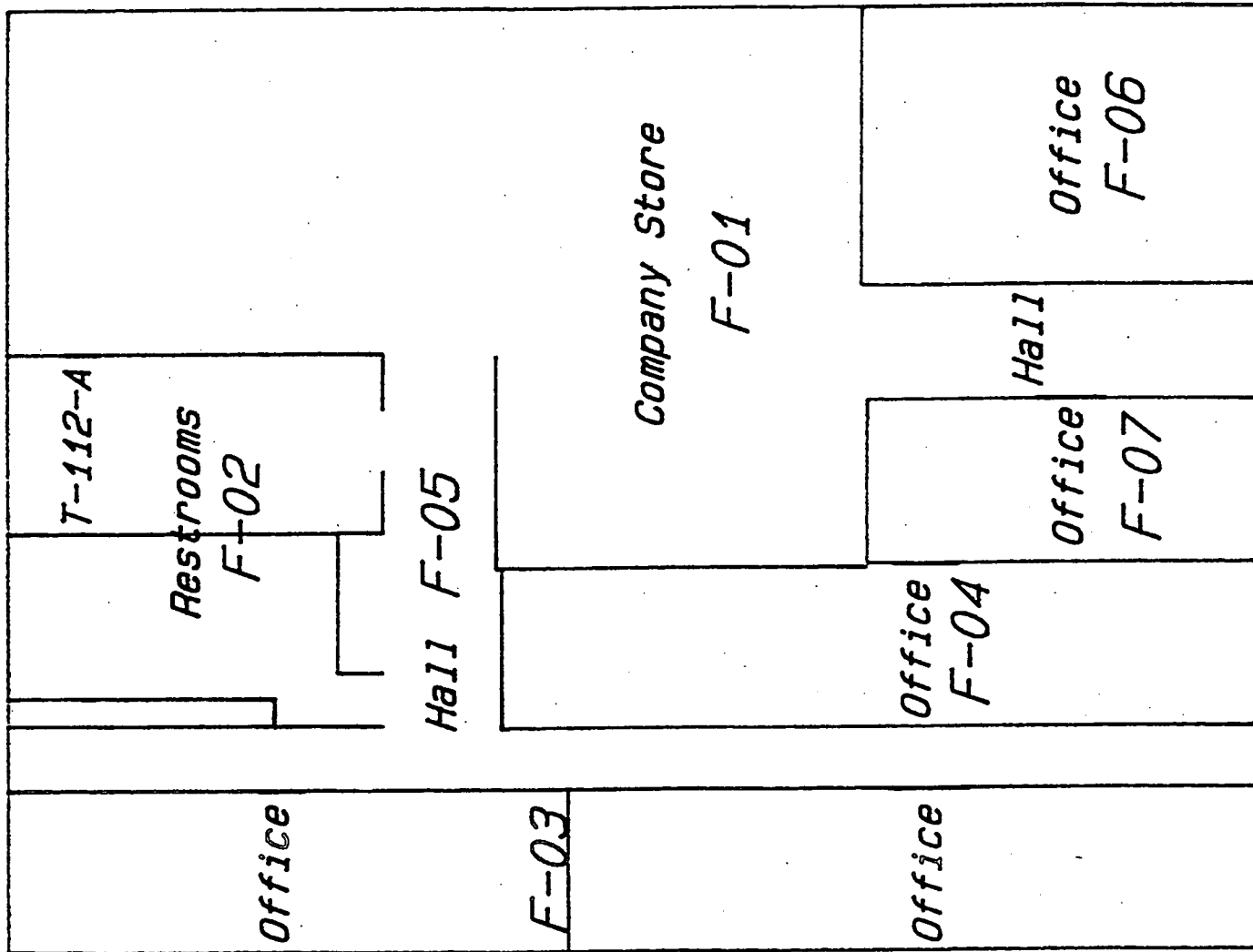
Different Alarums

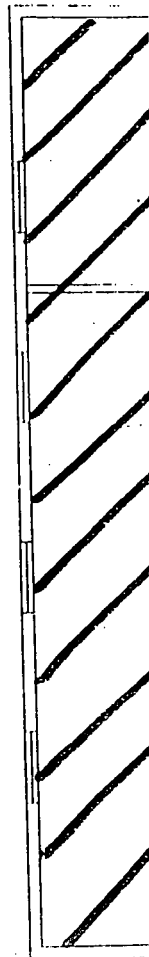
Legend: ☐ Original



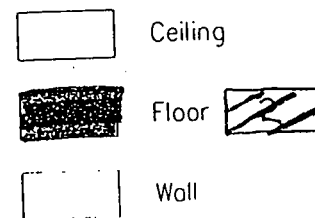
↑ Co ↓

[illegible]





HOMOGENEOUS LEGEND



Appendix 8
Historical Inspection Report for T112C

LAB I.D. 10768

RESERVOIRS ENVIRONMENTAL SERVICES, INC.

1827 GRANT STREET

DENVER, COLORADO 80203

(800) 678-7374

(303) 830-1986

FAX (303) 863-9196

July 19, 1994

Ms. Julie Linkus
EG&G Rocky Flats Plant
PO Box 464
Golden, CO 80402-0464

RE: Job No. RES 20769 - 23586JL/148A - Bulk Samples:
112C9407137301, 112C9407137302, 112C9407137303,
112C9407137304, 112C9407137305, 112C9407137306,
112C9407137307, 112C9407137308 and 112C9407137309.

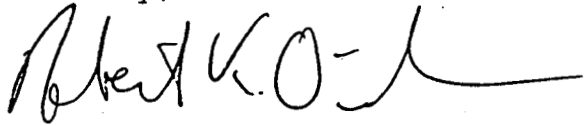
Dear Ms. Linkus:

Reservoirs Environmental Services, Inc. (RES, Inc.) has analyzed nine bulk material samples by Polarized Light Microscopy (PLM) for asbestos content as per your request. The samples were received on July 14, 1994, and initial results were telephoned to your office on July 18, 1994. PLM was used to analyze the bulk materials in compliance with guidelines established by the USEPA (40 CFR Part 763, Subpart F, Appendix A). The Analytical Results are presented in Table I.

RES, Inc. has assigned job number RES 20769 to this study. This report is considered highly confidential and the sole property of EG&G Rocky Flats Plant. RES, Inc. will not discuss any part of this study with personnel other than those of the client company. Samples will be disposed of after sixty days unless longer storage is requested. The US EPA guideline (40 CFR Part 763, Subpart F, Appendix A) was developed for use on friable building materials and is not recommended for non-friable materials such as floor tiles. RES, Inc. recommends additional analyses to confirm negative PLM results on floor tiles.

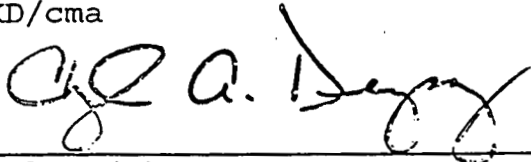
If you should have any questions about this report, please feel free to call me at 830-1986.

Sincerely,



Robert K. Dickson
Assistant Division Manager

RKD/cma



Analyst(s):

Cheryl A. Dempsey
Greg Behnfeldt
Patrick Coughlan

Paul D. Lo Scalzo
Robert L. Gault

RESERVOIRS ENVIRONMENTAL SERVICES, INC.

NVLAP Accredited Laboratory #1896

Page 1 of 2

TABLE I. PLM BULK ANALYSIS, PERCENTAGE COMPOSITION BY VOLUME

RES Job Number: RES 20769
 Client: EG&G Rocky Flats Plant
 Client Project: 23586JL/148A
 Date Samples Received: July 14, 1994
 Analysis Type: PLM Short Report
 Turnaround: 3-5 Day

| Client Sample Number | Lab ID Number | TOTAL ASBESTOS (%) | Layer | Physical Description | Portion of Total Sample (%) | ASBESTOS CONTENT BY LAYER | | Non-Asbestos Fibrous Components (%) | | | | | | | Non-Fibrous Components (%) |
|----------------------|---------------|--------------------|-------|-------------------------------------------------------|-----------------------------|---------------------------|---------------------|-------------------------------------|----|---|---|---|----|---|----------------------------|
| | | | | | | Mineral | Visual Estimate (%) | C | G | S | H | W | T | O | |
| | | | | | | | | E | L | Y | A | O | A | T | |
| | | | | | | | | L | A | N | I | L | L | H | |
| | | | | | | | | L | S | T | R | L | C | E | |
| | | | | | | | | | S | H | | | | R | |
| 112C9407137301 | EM 128544 | ND | A | White paint | 2 | | ND | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 98 |
| | | | B | Tan fibrous perlitic material w/tan resinous material | 98 | | ND | 30 | 35 | 0 | 0 | 0 | 0 | 0 | 35 |
| 112C9407137302 | EM 128545 | ND | A | White paint | 1 | | ND | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 97 |
| | | | B | Tan fibrous perlitic material | 99 | | ND | 25 | 40 | 0 | 0 | 0 | 0 | 0 | 35 |
| 112C9407137303 | EM 128546 | ND | A | Tan fibrous perlitic material w/tan resinous material | 100 | | ND | 30 | 35 | 0 | 0 | 0 | 0 | 0 | 35 |
| 112C9407137304 | EM 128547 | ND | A | White-gray resinous paint | 2 | | ND | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 95 |
| | | | B | Tan fibrous material | 15 | | ND | 90 | 0 | 0 | 0 | 0 | 0 | 0 | 10 |
| | | | C | White fibrous plaster | 83 | | ND | 2 | 8 | 0 | 0 | 0 | TR | 0 | 90 |
| 112C9407137305 | EM 128548 | ND | A | White-gray resinous paint | 2 | | ND | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 95 |
| | | | B | Tan fibrous material | 15 | | ND | 90 | 0 | 0 | 0 | 0 | 0 | 0 | 10 |
| | | | C | White fibrous plaster | 83 | | ND | 2 | 8 | 0 | 0 | 0 | 0 | 0 | 90 |
| 112C9407137306 | EM 128549 | ND | A | White-gray resinous paint | 2 | | ND | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 95 |
| | | | B | Tan fibrous material | 15 | | ND | 90 | 0 | 0 | 0 | 0 | 0 | 0 | 10 |
| | | | C | White fibrous plaster | 83 | | ND | 2 | 8 | 0 | 0 | 0 | 0 | 0 | 90 |

ND = None Detected
 TR = Trace

CELL = Cellulose
 Mat = Material

ORG = Organic
 BRUC = Brucite

WOLL = Wollastonite
 Trem-Act = Tremolite-Actinolite

GYP = Gypsum
 SYNTH = Synthetic

Analyst: LW/CD

Data QA

RESERVOIRS ENVIRONMENTAL SERVICES, INC.
NVLAP Accredited Laboratory #1896

Page

TABLE I. PLM BULK ANALYSIS, PERCENTAGE COMPOSITION BY VOLUME

RES Job Number: RES 20769
Client: EG&G Rocky Flats Plant
Client Project: 23586JL/148A
Date Samples Received: July 14, 1994
Analysis Type: PLM Short Report
Turnaround: 3-5 Day

| Client Sample Number | Lab ID Number | TOTAL ASBESTOS (%) | Layer | Physical Description | Portion of Total Sample (%) | ASBESTOS CONTENT BY LAYER | | Non-Asbestos Fibrous Components (%) | | | | | | | Non-Fibrous Components (%) |
|----------------------|---------------|--------------------|-------|-------------------------------|-----------------------------|---------------------------|---------------------|-------------------------------------|---|----|---|---|---|---|----------------------------|
| | | | | | | Mineral | Visual Estimate (%) | C | G | S | H | W | T | O | |
| | | | | | | | | E | L | Y | A | O | A | T | |
| | | | | | | | | L | A | N | I | L | L | H | |
| | | | | | | | | L | S | T | R | L | C | E | |
| | | | | | | | | S | H | | | | | R | |
| 112C9407137307 | EM 128550 | ND | A | Tan & white resin | 10 | | ND | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 98 |
| | | | B | Multicolored fibrous material | 90 | | ND | 2 | 0 | 93 | 0 | 0 | 0 | 0 | 5 |
| 112C9407137308 | EM 128551 | ND | A | White resin w/white plaster | 15 | | ND | 5 | 0 | TR | 0 | 0 | 0 | 0 | 95 |
| | | | B | Multicolored fibrous material | 85 | | ND | 0 | 0 | 90 | 0 | 0 | 0 | 0 | 10 |
| 112C9407137309 | EM 128552 | ND | A | White resin w/white plaster | 20 | | ND | 5 | 3 | 2 | 0 | 0 | 0 | 0 | 90 |
| | | | B | Multicolored fibrous material | 80 | | ND | 0 | 0 | 90 | 0 | 0 | 0 | 0 | 10 |

ND = None Detected
TR = Trace

CELL = Cellulose
Mat = Material

ORG = Organic
BRUC = Brucite

WOLL = Wollastonite
Trem-Act = Tremolite-Actinolite

GYP = Gypsum
SYNTH = Synthetic

15
Data QA

1 12094 07 13 73 02 □ SINGLE

112094 07 13 73 09 ☒ MULTIPLE

ROCKY FLATS PLANT

6. Analytical Sample Method: *+ PLM*

7. Lab Report #:

8. Lab Method:

9. Related Forms:

14. Results

misc

Random Sampling ^{GRID}

Random Sampling ^{GRID}

Random Sampling^{step}

Random Sampling Grid 2

Random Sampling Grid 2

Random Sampling Grid 2

Random Sampling Grid 3

Random Sampling Geid 3

Wayne D. Llewellyn 7-13-94

16. Checked by/Date (Check Back of Form):

Best Available Copy

EG&G Rockwell Labs Plant, Inc.

Golden, CO 80402-0464

Safety and Hygiene Chain of Custody Record and Analysis Request

| Name of Originator: <u>DDP/CO</u> | | Title: <u>Asbestos</u> | | Bldg/Ext: <u>100/1</u> | | Date: <u>7/13/84</u> | | Page <u>1</u> of <u>1</u> | |
|-----------------------------------|-------------|------------------------|-----------------|------------------------|-------------|--------------------------|---------|---------------------------|--|
| SAMPLE NUMBER Bldg/Y/M/D/P#/S# | ANALYZE FOR | VOLUME liters | SAMPLE TIME/ | MEDIA | P A B | Personal Area Bulk | REMARKS | Lab Number | |
| <u>100-1001-113-01</u> | | | | | | | | | |
| <u>100-1001-113-02</u> | | | | | | | | | |
| <u>100-1001-113-03</u> | | | | | | | | | |
| <u>100-1001-113-04</u> | | | | | | | | | |
| <u>100-1001-113-05</u> | | | | | | | | | |
| <u>100-1001-113-06</u> | | | | | | | | | |
| <u>100-1001-113-07</u> | | | | | | | | | |
| <u>100-1001-113-08</u> | | | | | | | | | |
| <u>100-1001-113-09</u> | | | | | | | | | |
| <u>100-1001-113-10</u> | | | | | | | | | |
| <u>100-1001-113-11</u> | | | | | | | | | |
| <u>100-1001-113-12</u> | | | | | | | | | |
| <u>100-1001-113-13</u> | | | | | | | | | |
| <u>100-1001-113-14</u> | | | | | | | | | |
| <u>100-1001-113-15</u> | | | | | | | | | |
| <u>100-1001-113-16</u> | | | | | | | | | |
| <u>100-1001-113-17</u> | | | | | | | | | |
| <u>100-1001-113-18</u> | | | | | | | | | |
| <u>100-1001-113-19</u> | | | | | | | | | |
| <u>100-1001-113-20</u> | | | | | | | | | |
| <u>100-1001-113-21</u> | | | | | | | | | |
| <u>100-1001-113-22</u> | | | | | | | | | |
| <u>100-1001-113-23</u> | | | | | | | | | |
| <u>100-1001-113-24</u> | | | | | | | | | |
| <u>100-1001-113-25</u> | | | | | | | | | |
| <u>100-1001-113-26</u> | | | | | | | | | |
| <u>100-1001-113-27</u> | | | | | | | | | |
| <u>100-1001-113-28</u> | | | | | | | | | |
| <u>100-1001-113-29</u> | | | | | | | | | |
| <u>100-1001-113-30</u> | | | | | | | | | |
| <u>100-1001-113-31</u> | | | | | | | | | |
| <u>100-1001-113-32</u> | | | | | | | | | |
| <u>100-1001-113-33</u> | | | | | | | | | |
| <u>100-1001-113-34</u> | | | | | | | | | |
| <u>100-1001-113-35</u> | | | | | | | | | |
| <u>100-1001-113-36</u> | | | | | | | | | |
| <u>100-1001-113-37</u> | | | | | | | | | |
| <u>100-1001-113-38</u> | | | | | | | | | |
| <u>100-1001-113-39</u> | | | | | | | | | |
| <u>100-1001-113-40</u> | | | | | | | | | |
| <u>100-1001-113-41</u> | | | | | | | | | |
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| <u>100-1001-113-46</u> | | | | | | | | | |
| <u>100-1001-113-47</u> | | | | | | | | | |
| <u>100-1001-113-48</u> | | | | | | | | | |
| <u>100-1001-113-49</u> | | | | | | | | | |
| <u>100-1001-113-50</u> | | | | | | | | | |
| <u>100-1001-113-51</u> | | | | | | | | | |
| <u>100-1001-113-52</u> | | | | | | | | | |
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| <u>100-1001-113-54</u> | | | | | | | | | |
| <u>100-1001-113-55</u> | | | | | | | | | |
| <u>100-1001-113-56</u> | | | | | | | | | |
| <u>100-1001-113-57</u> | | | | | | | | | |
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| <u>100-1001-113-62</u> | | | | | | | | | |
| <u>100-1001-113-63</u> | | | | | | | | | |
| <u>100-1001-113-64</u> | | | | | | | | | |
| <u>100-1001-113-65</u> | | | | | | | | | |
| <u>100-1001-113-66</u> | | | | | | | | | |
| <u>100-1001-113-67</u> | | | | | | | | | |
| <u>100-1001-113-68</u> | | | | | | | | | |
| <u>100-1001-113-69</u> | | | | | | | | | |
| <u>100-1001-113-70</u> | | | | | | | | | |
| <u>100-1001-113-71</u> | | | | | | | | | |
| <u>100-1001-113-72</u> | | | | | | | | | |
| <u>100-1001-113-73</u> | | | | | | | | | |
| <u>100-1001-113-74</u> | | | | | | | | | |
| <u>100-1001-113-75</u> | | | | | | | | | |
| <u>100-1001-113-76</u> | | | | | | | | | |
| <u>100-1001-113-77</u> | | | | | | | | | |
| <u>100-1001-113-78</u> | | | | | | | | | |
| <u>100-1001-113-79</u> | | | | | | | | | |
| <u>100-1001-113-80</u> | | | | | | | | | |
| <u>100-1001-113-81</u> | | | | | | | | | |
| <u>100-1001-113-82</u> | | | | | | | | | |
| <u>100-1001-113-83</u> | | | | | | | | | |
| <u>100-1001-113-84</u> | | | | | | | | | |
| <u>100-1001-113-85</u> | | | | | | | | | |
| <u>100-1001-113-86</u> | | | | | | | | | |
| <u>100-1001-113-87</u> | | | | | | | | | |
| <u>100-1001-113-88</u> | | | | | | | | | |
| <u>100-1001-113-89</u> | | | | | | | | | |
| <u>100-1001-113-90</u> | | | | | | | | | |
| <u>100-1001-113-91</u> | | | | | | | | | |
| <u>100-1001-113-92</u> | | | | | | | | | |
| <u>100-1001-113-93</u> | | | | | | | | | |
| <u>100-1001-113-94</u> | | | | | | | | | |
| <u>100-1001-113-95</u> | | | | | | | | | |
| <u>100-1001-113-96</u> | | | | | | | | | |
| <u>100-1001-113-97</u> | | | | | | | | | |
| <u>100-1001-113-98</u> | | | | | | | | | |
| <u>100-1001-113-99</u> | | | | | | | | | |
| <u>100-1001-113-100</u> | | | | | | | | | |

| | | | | | |
|---------------------------------------|---------------------------------------|----------------------------------|-----------------|-------------|-----------|
| Relinquished by <u>W. F. Dwyer</u> | Received by <u>Julius J. Smith</u> | Time/Date <u>1520 7-13-84</u> | Relinquished by | Received by | Time/Date |
| Relinquished by | Received by | Time/Date | Relinquished by | Received by | Time/Date |
| Relinquished by | Received by | Time/Date | Relinquished by | Received by | Time/Date |
| Relinquished by | Received by | Time/Date | Relinquished by | Received by | Time/Date |

| | | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Report and Billing Instruction Verbal To: <u> </u> Fax To: <u> </u> Report To: <u> </u> Bill To: <u> </u> P.O.#/Release: <u> </u> Lab: <u> </u> | Analysis Request Industrial Hygiene Sample <input type="checkbox"/> Standard Service <input type="checkbox"/> Rush <input type="checkbox"/> Other _____ Asbestos Samples <input checked="" type="checkbox"/> Standard Service <input type="checkbox"/> 24 Rush <input type="checkbox"/> 2 Rush <input type="checkbox"/> Other _____ | Seal# (Release #) <u>1484</u> Condition of Seal: <input type="checkbox"/> Broken <input type="checkbox"/> Unbroken Signature: _____ Comments: _____ |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

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Rocky Flats Plant Asbestos Containing Material

INSPECTION CHECKLIST

Appendix 1

No Asbestos Found

1. Inspector W.D. Lockwood Signature W.D. Lockwood Accreditation # _____ State CO
Date 7/19/94
2. BUILDING NO.: T112C
BLDG. AREA CODE: _____
☐ 1. 1st Floor ☐ 6. Crawl Space
☐ 2. 2nd Floor ☐ 7. Roof
☐ 3. 3rd Floor ☐ 8. Exterior of Bldg.
☐ 4. 4th Floor ☐ 9. Plenum
☐ 5. Basement ☐ 10. Other _____
3. ROOM NUMBER: _____
COLUMN NUMBERS _____
4. SPECIFIC LOCATION _____
5. % FUNCTIONAL SPACE _____
6. FUNCTIONAL SPACE LD. _____
HOMOGENEOUS AREA LD. _____
7. MATERIAL TYPE CATEGORY:
☐ T. Thermal System Insulation
☐ S. Surfacing Material
☐ M. Miscellaneous Material
- 8.1 TSI ACM: _____
PIPE LENGTH (FT) _____
- 8.2 TSI ACM: _____
PIPE DIAMETER (IN.) _____
- 8.3 TSI ACM: _____
PIPE WITH INSULATION DIAMETER (IN.) _____
- 8.4 SURFACING MISC. ACM: _____
- 8.5 TOTAL SURFACE MATERIAL (SQ. FT.) _____
- 8.6 SURFACING MISC. ACM: _____
DEPTH OF SURFACE MATERIAL (IN.) _____
- 9.1 FUNCTION CODE:
☐ 1. Acoustic Insulation ☐ 19. Exterior Construction
☐ 2. Baseboard ☐ 20. Floor Tile
☐ 3. Boiler/Furnace Insulation ☐ 21. Fire Stop
☐ 4. Caulking Mat'l ☐ 22. Fireproofing Insulation
☐ 5. Ceiling Tile ☐ 23. High Temp Water Pipe
☐ 6. Chilled Water Pipe ☐ 24. High Temp Water Pipe Fitting
☐ 7. Chilled Water Pipe Fitting ☐ 25. Mastic Adhesive
☐ 8. Cold Water Pipe ☐ 26. Roofing
☐ 9. Cold Water Pipe Fitting ☐ 27. Steam Pipe
☐ 10. Condensate Pipe ☐ 28. Steam Pipe Fitting
☐ 11. Condensate Pipe Fitting ☐ 29. Tank Insulation
☐ 12. Cooling Tower Baffles ☐ 30. Transite Board
☐ 13. Debris/Settled Dust ☐ 31. Vibration Damper
☐ 14. Domestic Cold Water Pipe ☐ 32. Wall Board
☐ 15. Domestic Cold Water Fitting ☐ 33. Wall Insulation
☐ 16. Door ☐ 34. Wall Plaster/Spackle
☐ 17. Drain Pipe ☐ 35. Other: _____
☐ 18. Duct Insulation
- 9.2 ASBESTOS FORM CODE:
☐ 1. Air cell ☐ 6. Pre-formed
☐ 2. Blanket ☐ 7. Sheet
☐ 3. Block ☐ 8. Sprayed On
☐ 4. Cloth ☐ 9. Troweled On
☐ 5. Loose fill ☐ 10. Other: _____
- 9.3 COLOR CODE:
☐ B Blue ☐ O Orange
☐ BL Black ☐ W White
☐ BR Brown ☐ Y Yellow
☐ G Green ☐ OT Other: _____
☐ GR Gray
10. CONSISTENCY:
☐ Brittle - hard ☐ Fibrous - loose
☐ Semi - solid ☐ Granular - pileable
11. CURRENTLY FRIABLE:
☐ Yes ☐ No
12. CURRENT MATERIAL DAMAGE:
☐ 1. No Visible Damage (U)
☐ 2. Damaged (D)
 < 10% Localized or
 < 25% Distributed
☐ 3. Significant Damage (S)
 10% or more Localized or
 25% or more Distributed
- 12.1 CAUSE OF DAMAGE:
☐ 1. Area Usage
☐ 2. Vibration
☐ 3. Air Flow
☐ 4. Water Damage
☐ 5. Service Activity
☐ 6. Usual Aging
☐ 7. Other: _____
13. CONTAMINANT PRESENT:
☐ 0. None
☐ 1. Spotty
☐ 2. Widely Scattered
☐ 3. Entire Area
14. DISPERSAL FACTOR:
☐ 1. Water ☐ 3. Occupant
☐ 2. Air ☐ 4. Machinery
15. AREA USED BY:
☐ Maintenance Workers
☐ Operations Workers
☐ Administrative Personnel
☐ Visiting Public

16. POTENTIAL FOR DAMAGE:

- ☐ Low Potential for damage (L)
- ☐ Potential for damage (M)
- ☐ Potential for significant damage (H)

17.1 DISTURBANCE POTENTIAL

FREQUENCY OF CONTACT/ACCESSIBILITY:

- ☐ 0. Low/Seldom (< 1 time/month)
(e.g., Area Rarely Used)
- ☐ 1. Moderate/Occasional (1-4 times/month)
(e.g., Rooms/Offices)
- ☐ 2. High/Frequently (>4 times/month)
(e.g., Hallways/Corridors)

17.2 DISTURBANCE POTENTIAL

INFLUENCE OF VIBRATION:

- ☐ 0. Low/None
- ☐ 1. Moderate/Noticeable
(Motors, loud sounds, vibrating ducts w/o fan, etc.)
- ☐ 2. High/Extreme
(Easily sensed vibration, vibrating duct w/fan, etc.)

17.3 DISTURBANCE POTENTIAL

POTENTIAL FOR AIR EROSION:

- ☐ 0. Low/None
- ☐ 1. Moderate or Noticeable Movement
(Air shaft, Air stream, vent, etc.)
- ☐ 2. High/Extreme velocity
(Air Plenum, Elevator Shaft, Fan Room, etc.)

17.4 DISTURBANCE POTENTIAL

OVERALL POTENTIAL FOR DAMAGE:

- ☐ 0. Low Potential for Damage
- ☐ 1. Potential for Damage
- ☐ 2. Potential for Significant Damage

18. PHYSICAL ASSESSMENT CATEGORY:

- ☐ 1. Damaged or Significantly Damaged TSI ACM
- ☐ 2. Damaged Friable Surfacing ACM
- ☐ 3. Significantly Damaged Friable Surfacing ACM
- ☐ 4. Damaged or Significantly Damaged Misc. ACM
- ☐ 5. ACBM with Potential for Damage
- ☐ 6. ACBM with Potential for Significant Damage
- ☐ 7. Any remaining Friable ACBM or Friable suspect ACBM

19. HAZARD POTENTIAL CLASSIFICATION:

- ☐ 1. ACBM in good condition w/low potential for disturbance
- ☐ 2. ACBM in good condition w/potential for damage
- ☐ 3. ACBM in good condition w/potential for significant damage
- ☐ 4. ACBM in Damaged condition w/low potential for disturbance
- ☐ 5. ACBM in Damaged condition w/potential for damage
- ☐ 6. ACBM in Damaged condition w/potential for significant damage
- ☐ 7. ACBM in a Significantly Damaged condition

20. RECOMMENDED RESPONSE ACTION:

- ☐ 1. Response Action #1
- ☐ 2. Response Action #2
- ☐ 3. Response Action #3
- ☐ 4. Response Action #4
- ☐ 5. Response Action #5
- ☐ 6. Response Action #6
- ☐ 7. Response Action #7
- ☐ 8. Response Action #8

21. DAMAGED INVENTORY PRIORITY

- ☐ 1 ☐ 2A ☐ 2B ☐ 3

22. PLANNED ACTIVITY:

- ☐ New Activity/Use
- ☐ System Maintenance
- ☐ Required Repair
- ☐ Renovation
- ☐ Demolition

23. OTHER SYSTEMS IMPACTED:

- ☐ System Shutdown
- ☐ Backup System In Use
- ☐ No Backup/Alternate
- ☐ Routine System Maintenance

24. POTENTIAL WASTE:

- ☐ Non friable
- ☐ Regulated ACM
- ☐ Radiological Contaminated
- ☐ RCRA Contaminated

25. SAMPLING:

- ☐ ≥ 3 , Non ACM, < 1000 ft.²
- ☐ ≥ 5 , Non ACM, < 5,000 ft.²
- ☐ ≥ 7 , Non ACM, > 5,000 ft.²
- ☐ ≥ 9 , Non ACM
- ☐ 0, Assumed ACM

25.1

| Sample # | % | Asbestos Type |
|----------|---|---------------|
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25.2 LAB REPORT _____

26. WORK PACKAGE NUMBERS

27. COMMENTS: _____

Appendix 1

1. Inspector W.D. Lockwood Signature W.D. Lockwood Accreditation # _____ State CO
Date _____
2. BUILDING NO.: T112C
BLDG. AREA CODE: _____
☒ 1. 1st Floor ☐ 6. Crawl Space
☐ 2. 2nd Floor ☐ 7. Roof
☐ 3. 3rd Floor ☐ 8. Exterior of Bldg.
☐ 4. 4th Floor ☐ 9. Plenum
☐ 5. Basement ☐ 10. Other _____
3. ROOM NUMBER: Comm. Room SE corner
COLUMN NUMBERS NA
4. SPECIFIC LOCATION SE corner
5. % FUNCTIONAL SPACE 100%
6. FUNCTIONAL SPACE I.D. 04
HOMOGENEOUS AREA I.D. _____
7. MATERIAL TYPE CATEGORY:
☐ T. Thermal System Insulation
☐ S. Surfacing Material
☒ M. Miscellaneous Material
- 8.1 TSI ACM:
PIPE LENGTH (FT.) NA
- 8.2 TSI ACM:
PIPE DIAMETER (IN.) NA
- 8.3 TSI ACM:
PIPE WITH INSULATION DIAMETER (IN.)
NA
- 8.4 SURFACING MISC. ACM:
- 8.5 TOTAL SURFACE MATERIAL (SQ. FT.)
686 sq ft
- 8.6 SURFACING MISC. ACM:
DEPTH OF SURFACE MATERIAL (IN.)
1/4"
- 8.1 FUNCTION CODE:
☐ 1. Acoustic Insulation ☐ 19. Exterior Construction
☐ 2. Baseboard ☐ 20. Floor Tile
☐ 3. Boiler/Furnace Insulation ☐ 21. Fire Stop
☐ 4. Caulking Mat'l ☐ 22. Fireproofing Insulation
☐ 5. Ceiling Tile ☐ 23. High Temp Water Pipe
☐ 6. Chilled Water Pipe ☐ 24. High Temp Water Pipe Fitting
☐ 7. Chilled Water Pipe Fitting ☐ 25. Mastic Adhesive
☐ 8. Cold Water Pipe ☐ 26. Roofing
☐ 9. Cold Water Pipe Fitting ☐ 27. Steam Pipe
☐ 10. Condensate Pipe ☐ 28. Steam Pipe Fitting
☐ 11. Condensate Pipe Fitting ☐ 29. Tank Insulation
☐ 12. Cooling Tower Baffles ☐ 30. Transite Board
☐ 13. Debris/Settled Dust ☐ 31. Vibration Damper
☐ 14. Domestic Cold Water Pipe ☐ 32. Wall Board
☐ 15. Domestic Cold Water Fitting ☐ 33. Wall Insulation
☐ 16. Domestic Cold Water Fitting ☐ 34. Wall Plaster/Spackle
☐ 17. Door ☐ 35. Other: Drop Ceiling
☐ 18. Drain Pipe
☐ 19. Duct Insulation
- 9.2 ASBESTOS FORM CODE:
☐ 1. Air cell ☐ 6. Pre-formed
☐ 2. Blanket ☐ 7. Sheet
☐ 3. Block ☐ 8. Sprayed On
☐ 4. Cloth ☐ 9. Troweled On
☐ 5. Loose fill ☐ 10. Other: _____
- 9.3 COLOR CODE:
☐ B Blue ☐ O Orange
☐ BL Black ☐ W White
☐ BR Brown ☐ Y Yellow
☐ G Green ☐ OT Other: _____
☐ GR Gray
10. CONSISTENCY:
☐ Brittle - hard ☐ Fibrous - loose
☐ Semi - solid ☐ Granular - pliable N/A
11. CURRENTLY FRAGILE:
☐ Yes ☒ No
12. CURRENT MATERIAL DAMAGE:
☒ 1. No Visible Damage (U)
☐ 2. Damaged (D)
 < 10% Localized or
 < 25% Distributed
☐ 3. Significant Damage (S)
 10% or more Localized or
 25% or more Distributed
- 12.1 CAUSE OF DAMAGE:
☐ 1. Area Usage
☐ 2. Vibration
☐ 3. Air Flow
☐ 4. Water Damage
☐ 5. Service Activity
☐ 6. Usual Aging
☐ 7. Other: N/A
13. CONTAMINANT PRESENT:
☐ 0. None
☐ 1. Spotty
☐ 2. Widely Scattered
☐ 3. Entire Area
14. DISPERSAL FACTOR:
☐ 1. Water ☐ 3. Occupant
☐ 2. Air ☐ 4. Machinery
15. AREA USED BY:
☐ Maintenance Workers
☐ Operations Workers
☐ Administrative Personnel
☐ Visiting Public

16. POTENTIAL FOR DAMAGE:

- ☐ Low Potential for damage (L)
- ☐ Potential for damage (M)
- ☐ Potential for significant damage (H)

17.1 DISTURBANCE POTENTIAL

FREQUENCY OF CONTACT/ACCESSIBILITY:

- ☐ 0. Low/Seldom (< 1 time/month)
(e.g., Area Rarely Used)
- ☐ 1. Moderate/Occasional (1-4 times/month)
(e.g., Rooms/Offices)
- ☐ 2. High/Frequently (>4 times/month)
(e.g., Hallways/Corridors)

17.2 DISTURBANCE POTENTIAL

INFLUENCE OF VIBRATION:

- ☐ 0. Low/None
- ☐ 1. Moderate/Noticeable
(Motors, loud sounds, vibrating ducts w/o fan, etc.)
- ☐ 2. High/Extreme
(Easily sensed vibration, vibrating duct w/fan, etc.)

17.3 DISTURBANCE POTENTIAL

POTENTIAL FOR AIR EROSION:

- ☐ 0. Low/None
- ☐ 1. Moderate or Noticeable Movement
(Air shaft, Air stream, vent, etc.)
- ☐ 2. High/Extreme velocity
(Air Plenum, Elevator Shaft, Fan Room, etc.)

17.4 DISTURBANCE POTENTIAL

OVERALL POTENTIAL FOR DAMAGE:

- ☐ 0. Low Potential for Damage
- ☐ 1. Potential for Damage
- ☐ 2. Potential for Significant Damage

18. PHYSICAL ASSESSMENT CATEGORY:

- ☐ 1. Damaged or Significantly Damaged TSI ACM
- ☐ 2. Damaged Friable Surfacing ACM
- ☐ 3. Significantly Damaged Friable Surfacing ACM
- ☐ 4. Damaged or Significantly Damaged Misc. ACM
- ☐ 5. ACBM with Potential for Damage
- ☐ 6. ACBM with Potential for Significant Damage
- ☐ 7. Any remaining Friable ACBM or Friable suspect ACBM

19. HAZARD POTENTIAL CLASSIFICATION:

- ☐ 1. ACBM in good condition w/low potential for disturbance
- ☐ 2. ACBM in good condition w/potential for damage
- ☐ 3. ACBM in good condition w/potential for significant damage
- ☐ 4. ACBM in Damaged condition w/low potential for disturbance
- ☐ 5. ACBM in Damaged condition w/potential for damage
- ☐ 6. ACBM in Damaged condition w/potential for significant damage
- ☐ 7. ACBM in a Significantly Damaged condition

20. RECOMMENDED RESPONSE ACTION:

- ☐ 1. Response Action #1
- ☐ 2. Response Action #2
- ☐ 3. Response Action #3
- ☐ 4. Response Action #4
- ☐ 5. Response Action #5
- ☐ 6. Response Action #6
- ☐ 7. Response Action #7
- ☐ 8. Response Action #8

21. DAMAGED INVENTORY PRIORITY

- ☐ 1 ☐ 2A ☐ 2B ☐ 3

22. PLANNED ACTIVITY:

- ☐ New Activity/Use
- ☐ System Maintenance
- ☐ Required Repair
- ☐ Renovation
- ☐ Demolition

23. OTHER SYSTEMS IMPACTED:

- ☐ System Shutdown
- ☐ Backup System In Use
- ☐ No Backup/Alternate
- ☐ Routine System Maintenance

24. POTENTIAL WASTE:

- ☐ Non friable
- ☐ Regulated ACM
- ☐ Radiological Contaminated
- ☐ RCRA Contaminated

25. SAMPLING:

- ☐ ≥ 3 , Non ACM, < 1000 ft²
- ☐ ≥ 5 , Non ACM, < 5,000 ft²
- ☐ ≥ 7 , Non ACM, > 5,000 ft²
- ☐ ≥ 9 , Non ACM
- ☐ 0, Assumed ACM

25.1

| Sample # | % | Asbestos Type |
|----------|---|---------------|
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25.2 LAB REPORT _____

26. WORK PACKAGE NUMBERS

27. COMMENTS:

Appendix 1

1. Inspector W.D. Lockwood Signature W.D. Lockwood Accreditation # _____ State CO
Date _____
2. BUILDING NO.: _____
BLDG. AREA CODE: _____

| | |
|---------------------------------------|-----------------------------------------------|
| <input type="checkbox"/> 1. 1st Floor | <input type="checkbox"/> 6. Craw. Space |
| <input type="checkbox"/> 2. 2nd Floor | <input type="checkbox"/> 7. Roof |
| <input type="checkbox"/> 3. 3rd Floor | <input type="checkbox"/> 8. Exterior of Bldg. |
| <input type="checkbox"/> 4. 4th Floor | <input type="checkbox"/> 9. Plenum |
| <input type="checkbox"/> 5. Basement | <input type="checkbox"/> 10. Other |
3. ROOM NUMBER: _____
COLUMN NUMBERS _____
4. SPECIFIC LOCATION _____
5. % FUNCTIONAL SPACE _____
6. FUNCTIONAL SPACE LD. _____
HOMOGENEOUS AREA LD. _____
7. MATERIAL TYPE CATEGORY:
☐ T. Thermal System Insulation
☐ S. Surfacing Material
☐ M. Miscellaneous Material
- 8.1 TSI/ACM: _____
PIPE LENGTH (FT) _____
- 8.2 TSI/ACM: _____
PIPE DIAMETER (IN.) _____
- 8.3 TSI/ACM: _____
PIPE WITH INSULATION DIAMETER (IN.) _____
- 8.4 SURFACING MISC. ACM: _____
- 8.5 TOTAL SURFACE MATERIAL (SQ. FT.) _____
- 8.6 SURFACING MISC. ACM: _____
DEPTH OF SURFACE MATERIAL (IN.) _____
- 9.1 FUNCTION CODE:

| | |
|----------------------------------------------------------|-----------------------------------------------------------|
| <input type="checkbox"/> 1. Acoustic Insulation | <input type="checkbox"/> 19. Exterior Construction |
| <input type="checkbox"/> 2. Baseboard | <input type="checkbox"/> 20. Floor Tile |
| <input type="checkbox"/> 3. Boiler/Furnace Insulation | <input type="checkbox"/> 21. Fire Stop |
| <input type="checkbox"/> 4. Caulking Mat'l | <input type="checkbox"/> 22. Fireproofing Insulation |
| <input type="checkbox"/> 5. Ceiling Tile | <input type="checkbox"/> 23. High Temp Water Pipe |
| <input type="checkbox"/> 6. Chilled Water Pipe | <input type="checkbox"/> 24. High Temp Water Pipe Fitting |
| <input type="checkbox"/> 7. Chilled Water Pipe Fitting | <input type="checkbox"/> 25. Mastic Adhesive |
| <input type="checkbox"/> 8. Cold Water Pipe | <input type="checkbox"/> 26. Roofing |
| <input type="checkbox"/> 9. Cold Water Pipe Fitting | <input type="checkbox"/> 27. Steam Pipe |
| <input type="checkbox"/> 10. Condensate Pipe | <input type="checkbox"/> 28. Steam Pipe Fitting |
| <input type="checkbox"/> 11. Condensate Pipe Fitting | <input type="checkbox"/> 29. Tank Insulation |
| <input type="checkbox"/> 12. Cooling Tower Baffles | <input type="checkbox"/> 30. Transite Board |
| <input type="checkbox"/> 13. Debris/Settled Dust | <input type="checkbox"/> 31. Vibration Dampor |
| <input type="checkbox"/> 14. Domestic Cold Water Pipe | <input type="checkbox"/> 32. Wall Board |
| <input type="checkbox"/> 15. Domestic Cold Water Fitting | <input type="checkbox"/> 33. Wall Insulation |
| <input type="checkbox"/> 16. Door | <input type="checkbox"/> 34. Wall Plaster/Spackle |
| <input type="checkbox"/> 17. Drain Pipe | <input type="checkbox"/> 35. Other: _____ |
| <input type="checkbox"/> 18. Duct Insulation | |
- 9.2 ASBESTOS FORM CODE:

| | |
|----------------------------------------|-------------------------------------------|
| <input type="checkbox"/> 1. Air cell | <input type="checkbox"/> 5. Pre-formed |
| <input type="checkbox"/> 2. Blanket | <input type="checkbox"/> 7. Sheet |
| <input type="checkbox"/> 3. Block | <input type="checkbox"/> 8. Sprayed On |
| <input type="checkbox"/> 4. Cloth | <input type="checkbox"/> 9. Troweled On |
| <input type="checkbox"/> 5. Loose fill | <input type="checkbox"/> 10. Other: _____ |
- 9.3 COLOR CODE:

| | |
|-----------------------------------|------------------------------------------|
| <input type="checkbox"/> B Blue | <input type="checkbox"/> O Orange |
| <input type="checkbox"/> BL Black | <input type="checkbox"/> W White |
| <input type="checkbox"/> BR Brown | <input type="checkbox"/> Y Yellow |
| <input type="checkbox"/> G Green | <input type="checkbox"/> OT Other: _____ |
| <input type="checkbox"/> GR Gray | |
10. CONSISTENCY:
☐ Brittle - hard ☐ Fibrous - loose
☐ Semi - solid ☐ Granular - pilable
11. CURRENTLY FRAGILE:
☐ Yes ☐ No
12. CURRENT MATERIAL DAMAGE:
☐ 1. No Visible Damage (U)
☐ 2. Damaged (D)
 < 10% Localized or
 < 25% Distributed
☐ 3. Significant Damage (S)
 10% or more Localized or
 25% or more Distributed
- 12.1 CAUSE OF DAMAGE:
☐ 1. Area Usage
☐ 2. Vibration
☐ 3. Air Flow
☐ 4. Water Damage
☐ 5. Service Activity
☐ 6. Usual Aging
☐ 7. Other: _____
13. CONTAMINANT PRESENT:
☐ 0. None
☐ 1. Spotty
☐ 2. Widely Scattered
☐ 3. Entire Area
14. DISPERSAL FACTOR:
☐ 1. Water ☐ 3. Occupant
☐ 2. Air ☐ 4. Machinery
15. AREA USED BY:
☐ Maintenance Workers
☐ Operations Workers
☐ Administrative Personnel
☐ Visiting Public

16. POTENTIAL FOR DAMAGE:

- ☐ Low Potential for damage (L)
- ☐ Potential for damage (M)
- ☐ Potential for significant damage (H)

17.1 DISTURBANCE POTENTIAL

FREQUENCY OF CONTACT/ACCESSIBILITY:

- ☐ 0. Low/Seldom (< 1 time/month)
(e.g., Area Rarely Used)
- ☐ 1. Moderate/Occasional (1-4 times/month)
(e.g., Rooms/Offices)
- ☐ 2. High/Frequently (>4 times/month)
(e.g., Hallways/Corridors)

17.2 DISTURBANCE POTENTIAL

INFLUENCE OF VIBRATION:

- ☐ 0. Low/None
- ☐ 1. Moderate/Noticeable
(Motors, loud sounds, vibrating ducts w/o fan, etc.)
- ☐ 2. High/Extreme
(Easily sensed vibration, vibrating duct w/fan, etc.)

17.3 DISTURBANCE POTENTIAL

POTENTIAL FOR AIR EROSION:

- ☐ 0. Low/None
- ☐ 1. Moderate or Noticeable Movement
(Air shaft, Air stream, vent, etc.)
- ☐ 2. High/Extreme velocity
(Air Plenum, Elevator Shaft, Fan Room, etc.)

17.4 DISTURBANCE POTENTIAL

OVERALL POTENTIAL FOR DAMAGE:

- ☐ 0. Low Potential for Damage
- ☐ 1. Potential for Damage
- ☐ 2. Potential for Significant Damage

18. PHYSICAL ASSESSMENT CATEGORY:

- ☐ 1. Damaged or Significantly Damaged TSI ACM
- ☐ 2. Damaged Friable Surfacing ACM
- ☐ 3. Significantly Damaged Friable Surfacing ACM
- ☐ 4. Damaged or Significantly Damaged Misc. ACM
- ☐ 5. ACBM with Potential for Damage
- ☐ 6. ACBM with Potential for Significant Damage
- ☐ 7. Any remaining Friable ACBM or Friable suspect ACBM

19. HAZARD POTENTIAL CLASSIFICATION:

- ☐ 1. ACBM in good condition w/low potential for disturbance
- ☐ 2. ACBM in good condition w/potential for damage
- ☐ 3. ACBM in good condition w/potential for significant damage
- ☐ 4. ACBM in Damaged condition w/low potential for disturbance
- ☐ 5. ACBM in Damaged condition w/potential for damage
- ☐ 6. ACBM in Damaged condition w/potential for significant damage
- ☐ 7. ACBM in a Significantly Damaged condition

20. RECOMMENDED RESPONSE ACTION:

- ☐ 1. Response Action #1
- ☐ 2. Response Action #2
- ☐ 3. Response Action #3
- ☐ 4. Response Action #4
- ☐ 5. Response Action #5
- ☐ 6. Response Action #6
- ☐ 7. Response Action #7
- ☐ 8. Response Action #8

21. DAMAGED INVENTORY PRIORITY

- ☐ 1 ☐ 2A ☐ 2B ☐ 3

22. PLANNED ACTIVITY:

- ☐ New Activity/Use
- ☐ System Maintenance
- ☐ Required Repair
- ☐ Renovation
- ☐ Demolition

23. OTHER SYSTEMS IMPACTED:

- ☐ System Shutdown
- ☐ Backup System In Use
- ☐ No Backup/Alternate
- ☐ Routine System Maintenance

24. POTENTIAL WASTE:

- ☐ Non friable
- ☐ Regulated ACM
- ☐ Radiological Contaminated
- ☐ RCRA Contaminated

25. SAMPLING:

- ☐ ≥ 8, Non ACM, < 1000 ft²
- ☐ ≥ 6, Non ACM, < 5,000 ft²
- ☐ ≥ 7, Non ACM, > 5,000 ft²
- ☐ ≥ 9, Non ACM
- ☐ 0, Assumed ACM

25.1

| Sample # | % | Asbestos Type |
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25.2 LAB REPORT _____

26. WORK PACKAGE NUMBERS

27. COMMENTS: _____

NEW Trailer All Areas marked

T-112-C

Offices

112C9407137309
W.D. LOCKWOOD X3484
427293DE7017C-27
Floor

Telecom

112C9407137301
W.D. LOCKWOOD X3484
427293DE7017C-27
Ceiling

112C9407137304
W.D. LOCKWOOD X3484
427293DE7017C-27
Wall

112C9407137305
W.D. LOCKWOOD X3484
427293DE7017C-27
Wall

Hall

112C9407137308
W.D. LOCKWOOD X3484
427293DE7017C-27
Floor

Offices

112C9407137306
W.D. LOCKWOOD X3484
427293DE7017C-27
Wall

Offices

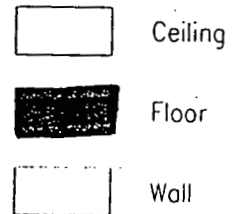
112C9407137303
W.D. LOCKWOOD X3484
427293DE7017C-27
Ceiling

112C9407137307
W.D. LOCKWOOD X3484
427293DE7017C-27
Floor

1000 sq. ft.

ROCKY FLATS ENVIRONMENT,
TECHNOLOGY SITE
T-112C

HOMOGENEOUS LEGEND



Appendix 9

RLC Inspection Report for T112A

ASBESTOS INSPECTION REPORT

BUILDING T112A PU&D YARD

September 27, 1999

Prepared for: Paul Wojtaszek
Rocky Mountain Remediation Services

Prepared by: Commodore Advanced Sciences, Inc.
143 Union Blvd., Ste. 660
Lakewood, CO 80228
RFETS: T891V; x-6508

COMMODORE
ADVANCED SCIENCES, INC.

Jen Wingard
Sampling Technician
jen.wingard@rfets.gov

RFETS, Bldg #T891V
P.O. Box 464
Golden, CO 80402-0464
Phone: (303) 966-6508
Fax: (303) 966-3308
Pager: (303) 212-3184

143 Union Blvd., Ste. 660
Lakewood, CO 80228
Phone: (303) 980-0036
Fax (303) 980-1206

1.0 SUMMARY

An asbestos inspection of trailer T112A was conducted by Commodore Advanced Sciences at Rocky Flats Environmental Technology Site (RFETS) on September 27, 1999. Inspection and sampling was conducted for Paul Wojtaszek to determine the trailer's asbestos quantities for demolition and future disposal in a landfill.

2.0 SCOPE

Commodore Advanced Sciences was responsible for visual inspection of specified areas to identify asbestos-containing material (ACM); bulk sampling of suspect materials and transport of samples to an accredited lab for analysis by Polarized Light Microscopy (PLM).

3.0 PROCEDURE

Inspection and sampling were performed by Jen Wingard, a licensed Asbestos Inspector certified by the State of Colorado and the Environmental Protection Agency. All work was completed per 40 CFR 763.86, 5 CCR 1000-10, RFETS Asbestos Characterization Procedure (PRO-563-ACPR), and CAS Sampling for Waste Characterization (CAS SOP-003). Michelle Hershey acted as witness and spotter as needed.

Bulk samples were delivered to CAS trailer T891R for shipment to the accredited lab Reservoirs Environmental Inc.

4.0 RESULTS

Building T112A is a five-wide trailer previously used for administrative offices and currently abandoned and located in the PU&D yard awaiting disposal. It is a wood and metal structure that contains multiple office-type rooms and two restrooms. The inside walls consisted of wood paneling with two "newer" drywall walls that had no surface coverings or taped joints. No samples were collected.

The floors consisted of carpet and tile. A different contractor previously sampled ceiling tile and floor tile on 4/21/99. Both contained no asbestos components. The tile mastic was found to contain 70% Chrysotile. On 9/27/99 CAS made the assumption that the cove base cement used in both bathrooms is also non-friable asbestos-containing material. No samples were collected.

Air ducts and waterlines were not individually insulated and had only the existing loose fiberglass insulation around them. Electrical lines and panels were also free of any potential ACM. No samples were collected.

One roof sample was collected which consisted of four layers. There was a gray putty-like material, which appeared to be used to hold the five sections of the trailer together. The actual roofing material consisted of two layers of brown resinous material on top of a very thin layer of silver paint or paper. Reservoirs Environmental Inc. which analyzed the samples found the putty to contain 15% Chrysotile, the silver paint 4% Chrysotile and the remainder free of asbestos. All materials were non-friable.

Inspection Summary Table:

| Potential ACBM | Locations | Conclusion |
|---------------------------|------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
| Surfacing Material | None detected | N/A |
| Thermal System Insulation | None detected | N/A |
| Miscellaneous | Tile mastic; non-friable Cove base cement; non-friable Roofing, non-friable: Putty/plaster Resinous material Silver paint | 70% Chrysotile; 4/21/99 Assumed; 9/27/99 15% Chrysotile; 9/27/99 N/A 4% Chrysotile; 9/27/99 |

5.0

ATTACHMENTS

Chain-of-custody for sample 99Z0382-001.001 (T112A9909270101)

Analytical data from Reservoirs Environmental Services, Inc.

Asbestos Sampling Data Sheet

Asbestos Containing Material Inventory Worksheet

Field worksheet

RESERVOIRS ENVIRONMENTAL SERVICES, INC.
 NVLAP Accredited Laboratory #1896

Page 1 of 1

TABLE I. PLM BULK ANALYSIS, PERCENTAGE COMPOSITION BY VOLUME

RES Job Number:
 Client:
 Client Project:
 Data Samples Received:
 Analysis Type:
 Turnaround:

RES 63457-1
 Kaiser-Hill Analytical Services Division
 99Z0382, J. Wingard
 September 27, 1999
 PLM Short Report, Bulk
 2 Hour

Note: The US EPA requires use of stratified analysis for NESHAP and
 AHERA compliance. Composite results only apply for specific exceptions.

| Client Sample Number | Lab ID Number | L a y e r | Physical Description | Portion of Total Sample (%) | ASBESTOS CONTENT | | Non-Asbestos Fibrous Components (%) | | | | | | | | Non-Fibrous Components (%) |
|----------------------------|------------------|-----------------------|-------------------------|--------------------------------------|------------------|---------------------------|----------------------------------------|---|---|---|---|---|---|--|----------------------------------|
| | | | | | BY LAYER | | C | G | S | H | W | T | O | | |
| | | | | | Mineral | Visual Estimate (%) | E | L | Y | A | O | A | T | | |
| | | | | | | | L | A | N | I | L | L | H | | |
| | | | | | | | L | S | T | R | L | C | E | | |
| | | | | | | | S | H | | | | | R | | |
| 99Z0382-001 | EM 435244 | A | Silver paint | 3 | Chrysotile | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 96 |
| | | B | Brown resinous material | 17 | | ND | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 100 |
| | | C | Gray plaster | 80 | Chrysotile | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 85 |

ND = None Detected

CELL = Cellulose

ORG = Organic

WOLL = Wollastonite

GYP = Gypsum

Analyst: PDL

TR = Trace, < 1% Visual Estimate

Trem-Ac1 = Tremolite-Actinolite

BRUC = Brucite

SYNTH = Synthetic

Data OK

RES 63457

09/28/99 TUE 07:14 FAX 303 863 9196

RES. ENV. SERV.

003

SAMPLERS (Signature) *[Signature]*

REPORT IDENTIFICATION NUMBER (RIN) 99Z0382

LAB LOCATION: RESERVOIRS

RFETS CONTRACTOR CAS

**ROCKY FLATS
ENVIRONMENTAL TECHNOLOGY SITE
CHAIN OF CUSTODY NUMBER 99Z0382-001**

| DATE | TIME | EVENT | BOTTLE | USER ID | LOCATION | CONTAINER | MATRIX |
|---------|------|-------|--------|--------------|----------|-----------|--------|
| 9/21/99 | 1356 | 001 | 001 | 112810123001 | ROOF | NA | SOLID |

[Handwritten: RUSH 2HR, 11:02 AM, 9/21/99]

| | | | |
|--------------------------------------------------------------------------------------------------------------------------------------------|---------|------|--------------------------|
| Received By: | Date | Time | Received By/Organization |
| <i>[Signature]</i> | 9/21/99 | 1410 | <i>[Signature]</i> |
| <i>[Signature]</i> | 9/27/99 | 1345 | <i>[Signature]</i> |
| PKG RECEIPT CUSTODY SEALS INTACT <i>[Initials]</i> SAMPLE LABELS/POCS AGREE <i>[Initials]</i> TEMPERATURE AT TIME OF RECEIPT ____ °C | | | |
| REMARKS | | | |
| Charge # | | | |
| Project | | | |

Best Available Copy

P. 04

FAX NO. 303 966 4555

SEP-28-1999 TUE 09:06 AM SOURCE ONE ASD

| Kali | | CHAIN OF CUSTODY SAMPLE ANALYSIS REQUEST | | | | | | C.O.C.# 99Z038 | | | | | | | | |
|------------------------------------------|-----------------|--------------------------------------------------------------------------------|-----------|------|--------------|-------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|-------------------|-----------------------|-----------|-----------|--|--------------|--|-----------|--|
| RFETS | | | | | | | | Page 1 of 1 | | | | | | | | |
| Collector | | Contact/Requester CICHORZ, ROGER | | | | Telephone No. MSN FAX 303-966-2155 | | | | | | | | | | |
| RIN 99Z0382 | | Sampling Origin | | | | Purchase Order/Charge Code 15010420 | | | | | | | | | | |
| Project Title | | Logbook No. | | | | Ice Chest No. | | Temp. | | | | | | | | |
| To (Lab) Reservoirs Environmental | | Method of Shipment | | | | Bill of Lading/Air Bill No. | | | | | | | | | | |
| Protocol | | | | | | PRE | | | | | | | | | | |
| POSSIBLE SAMPLE HAZARDS/REMARKS ** ** | | | | | | SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption: Yes <input type="checkbox"/> No <input type="checkbox"/> | | | | | | | | | | |
| Bottle No. | Customer Number | Matrix | Date | Time | Location | No/Type Container | Sample Analysis | | Preservative; Packing | | | | | | | |
| 99Z0382-001.001 | T1129092701011 | IH | | | T112A | I-NA N/A | IH02B004 (Asbestos - bulk (PLM) off-site) [Rush] | | N/A None | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
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| | | | | | | | | | | | | | | | | |
| Relinquished By: | | | Date/Time | | Received By: | | Date/Time | | Relinquished By: | | Date/Time | | Received By: | | Date/Time | |
| Relinquished By: | | | Date/Time | | Received By: | | Date/Time | | Relinquished By: | | Date/Time | | Received By: | | Date/Time | |
| Relinquished By: | | | Date/Time | | Received By: | | Date/Time | | Relinquished By: | | Date/Time | | Received By: | | Date/Time | |
| Relinquished By: | | | Date/Time | | Received By: | | Date/Time | | Relinquished By: | | Date/Time | | Received By: | | Date/Time | |
| FINAL SAMPLE DISPOSITION | | Disposal Method (e.g., Return to customer, per lab procedure, used in process) | | | | | | Disposed By: | | Date/Time | | | | | | |

Asbestos Containing Material Inventory Worksheet

Building Number T112A Room Number NA Date 9/27/99
Pipe insulation:

Type: NO ACM; FIBERGLASS ONLY Linear/sq. ft. _____ Fitting count: _____

Type: _____ Linear/sq. ft. _____ Fitting count: _____

Type: _____ Linear/sq. ft. _____ Fitting count: _____

Type: _____ Linear/sq. ft. _____ Fitting count: _____

Duct insulation:

Type: NO ACM; FIBERGLASS ONLY Duct Size/app. _____ Sq. ft. _____

Type: _____ Duct Size/app. _____ Sq. ft. _____

Type: _____ Duct Size/app. _____ Sq. ft. _____

Type: _____ Duct Size/app. _____ Sq. ft. _____

Other: _____

SURFACE INVENTORY:

Location: NO ACM Description: _____ Sq. ft. _____

Location: _____ Description: _____ Sq. ft. _____

Location: _____ Description: _____ Sq. ft. _____

Location: _____ Description: _____ Sq. ft. _____

MISCELLANEOUS INVENTORY:

Location: Bathrooms Description: corebase cement Sq. ft. _____

Location: Floor Tile Description: Tile mastic Sq. ft. _____

Location: Roof Description: Gray putty-like cement Sq. ft. _____

Location: Roof Description: Silver paint/paper Sq. ft. _____

PREPARED BY JEN WINGARD DATE 9/27/99

SIGNATURE Jen Wingard

FIELD
ASI SAMPLE REQUEST WORKSHEET

RIN: 99Z0382
EVENT: 001
DUPLICATE ID: NA
ISSUE DATE: 092799

WASTE STREAM ID: NA
CUSTOMER SAMPLE ID:
FIELD BLANK ID:
EQUIPMENT BLANK ID:
TRIP BLANK: ↓

Comments/Problems encountered during sampling: We sampled on the
roof between sections at point "F12" labeled in tape.
TW sampled; MH witnessed.
NO SAP required per customer; no air pump required per MH.

Location Description: TRAILER 112A LOCATED IN PUDD YARD.
ROOF SITE "F12"

Other ID: T1129909270101

Sample Appearance: grey clay-like material with
silver paper on brown material on black material.

Sampling Device: chisel, metal

Sample Date: 9/27/99 Sample Time: 1338 Rad Screen Sample Date: NA

Was generator notified to receive excess sample? (Yes) ☒ (No) ☐

Sampler's Signature: jwmgard Michelle Hershey
SAMPLE WITNESS ONLY.

Employee Number:

Date: 9/27/99 9/27/99

Asbestos Sampling Data Sheet

Job # 9920382

Name JEN WINGARD

Date 9/27/99

General Description of building/area: BLDG T112A IN PV & D YARD (TRAILER)

| Sample Number | Sample Description and Location |
|-----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| T112A9909270101 | ROOFING MATERIALS : GRAY PUTTY FROM BETWEEN TRAILER SECTIONS ; ROOF RESINOUS COMPOSITE 2 BROWN LAYERS WITH SILVER PAINT OR PAPER FIRMLY ATTACHED. |
| SW 9/27/99 | |

PREPARED BY JEN WINGARD

DATE 9/27/99

SIGNATURE

jen wingard

$$265 / 265$$